THE JOURNAL
of the American Medical Association
Published Under the Auspices of the Board of Trustees
VOL. 146, NO. 4 CHICAGO, ILLINOIS MAY 26, 1951
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ACUTE CHOLECYSTITIS

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The management of patients with acute inflammation of the gallbladder has for many years been a controversial subject. Whether the gallbladder should be removed on the diagnosis or whether there should be a delay, with observation, symptomatic therapy and operation at an elected time, are questions which represent the two main extremes of opinion. An analysis of 109 patients with acute cholecystitis treated in the University Hospital in the past 15 years demonstrates the necessity for treating patients individually since they are seen at such varying stages of the acute phase of the disease. The difficulty experienced in confirming a diagnosis early in the course of disease and in predicting the trend of this disorder has led us to adopt certain criteria for early operation. A compilation of the surgical methods used during the years of this analysis shows a variable but increasing conservatism in contrast to the trend generally expressed in current surgical discussions.

The frequency with which acute inflammation of the gallbladder occurs among patients with cholecystitis appears to differ markedly in the judgment of surgeons writing on the clinical evaluation of this diagnosis. Thus, the awareness of this complication and its prompt surgical correction have been greatly emphasized by some, whereas its infrequency elsewhere has brought about little concern or apprehension over its existence. Adams and Stranahan [1] found the incidence to be 5 per cent among 1,104 patients while Heuer [2] noted acute cholecystitis in 23.5 per cent of 1,142 patients. At the University of Michigan Hospital 109 persons had acute cholecystitis in the years 1934 to 1949 in a series of 7,019 patients with all types of diseases of the gallbladder and the biliary tract (excluding neoplasms and trauma), an incidence of 1.5 per cent. While the methods of computing these percentages must differ to some extent, there does appear to be wide variation in the occurrence of this complication of cholecystitis. There is no clear explanation of this changing incidence.

INCIDENCE OF ACUTE CHOLECYSTITIS

An accurate estimate of the incidence of acute cholecystitis is most readily made when early operation is carried out. When a more conservative approach is used, a late review of the benign course, with prompt recovery of many patients for whom the initial diagnosis was acute cholecystitis, frequently questions the correctness of this diagnosis. A diagnosis of acute cholecystitis was made for 338 patients whose records were reviewed in this 15 year survey. Without histopathologic confirmation on all, only 109 patients are acceptable for this study. It is more than likely that many patients treated without operation might have shown acute cholecystitis had the gallbladder been removed and been examined by a pathologist.

Our failure to accept, from a study of the records alone, a diagnosis of acute cholecystitis in many cases in which it was recorded throws some doubt on the not infrequently repeated statement that the clinical diagnosis of acute cholecystitis is not difficult.[3] The prompt recovery of more than twice the number of persons selected for study in this paper indicates the vagueness with which the diagnosis may be made. It also suggests that if it is assumed that a correct diagnosis was made in only part of this group, operation would have been unnecessary in many.

SURGICAL INTERVENTION

The importance of early surgical intervention in the treatment of most patients with acute cholecystitis has been frequently insisted on and widely accepted.[4] Any divergence of opinion is concerned primarily with the

Supported in part by funds from the John Harper Seeley Foundation.
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Read before the Section on Surgery, General and Abdominal, at the Ninety-Ninth Annual Session of the American Medical Association, San Francisco, June 28, 1950.

1. Adams, R., and Stranahan, A.: Surg., Gynec. & Obst. **85**:776-784, 1947.
2. Heuer, G. J.: New International Clinics **3**:121-134, 1940.
3. (*a*) Eckel, J. H.: S. Clin. North America **30**:451-459, 1950. (*b*) Judd, E. S.: Proc. Staff Meet., Mayo Clin. **23**:142-147, 1948.
4. (*a*) Wallace, R. H., and Allen, A. W.: Arch Surg. **43**:762-772 (Nov.) 1941. (*b*) Dunphy, J. E., and Ross, F. P.: Surgery **26**:539-547, 1949. (*c*) Glenn, F.: Surg., Gynec. & Obst. **90**:643-648, 1950. Adams and Stranahan.[1] Heuer.[2] Eckel.[3a]

method of operative procedure and with the definition of the limit of "early" intervention. Prolonged observation with the hope that the existing acute process will subside is admittedly somewhat hazardous since perforation of the gallbladder and the formation of an abscess are known to occur while the clinical manifestations of the

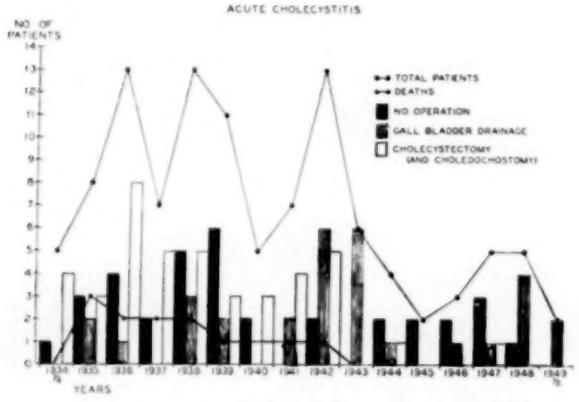

Fig. 1.—Data on 109 patients with acute cholecystitis.

disease are subsiding. Yet the experienced physician may utilize this waiting period well for the correction of dehydration, administration of vitamins and antibiotic agents and the restoration toward normal of many upset bodily functions. By so doing the accomplishment of elective operation at a later date may be immeasurably facilitated.

The realization that the condition of the patient at the initial examination is of first importance, rather than the duration of the acute disease, has been a major step in the definition of the time for operation. With this recognition and the prompt correction of existing chemical and physiologic imbalances has come the sharp decline in mortality rates for cholecystectomy and choledochostomy when applied to patients with acute cholecystitis. The term "early surgical intervention" has thus come to mean surgical intervention as soon as the general condition of the patient has been improved to such a degree that it no longer contraindicates operation. Short of this ideal, surgical intervention must be limited unquestionably to simple drainage of the gallbladder.

Great significance has been attached by Heuer,[2] Glenn,[4c] Dunphy and Ross [4b] and others to the low mortality rate of acute cholecystitis treated by cholecystectomy. The disease has been likened in its course and the seriousness of its complications to acute appendicitis, and treatment has been directed, as in appendicitis, to removal of the inflamed organ. That immediate surgical removal of the gallbladder does not constitute the entire explanation for the acute decline in mortality rates for these patients is apparent from a study of figure 1. It is to be noted that in the last decade depicted in this graph there has been but one death from acute cholecystitis, yet the trend of surgical attack has veered sharply toward more conservative management. More likely this improvement in end results has stemmed from our improved preoperative management. Much credit may be given to the intense application of the antibiotic agents as they are now used.

During the entire period of this study 42 patients underwent cholecystectomy (table 1) in the definitive management of their acute disease. More than one half of the operations (27) were done during the first five years covered by this study. Nine of these patients also underwent exploration of the common and hepatic bile ducts; stones were present in the ducts of four. Five, or 11.9 per cent, of the patients died after cholecystectomy. This high death rate, while attributed to the operative procedure, is not necessarily representative of the hazard of the operation at the present time. Two of the patients died after operation of cardiac failure, another of cardiac failure, aspiration pneumonia and pulmonary gangrene, another of pneumonia and the fifth of peritonitis and subphrenic abscess. Conceivably, all might have survived with better preoperative and postoperative management supplemented by the liberal use of the antibiotic agents.

Simple drainage of the gallbladder was done on 31 patients, seven in the early five year period and 24 in the last decade. Three of these patients died, a mortality rate of 9.6 per cent. One of the patients died of hemorrhage, due, probably, to vitamin K deficiency, another of pneumonia and the third of bile peritonitis diagnosed and treated initially as acute, perforated appendicitis. Again, at least two of these patients might well have survived under present day management. In many instances this surgical measure was obligatory because of the patient's general condition or the advanced stage of infection in the biliary tract.

Thirty-six patients underwent no operation at the time of their acute episode of gallbladder disease. These patients were treated with bed rest, sedation, parenteral administration of fluids, gastric suction and later antibiotic agents. Three of them died. One patient was admitted to the hospital moribund, with generalized peritonitis, and the outcome probably could have been changed little at the present time. The second patient was thought to have coronary occlusion and at necropsy had necrotizing cholecystitis, without perforation, and a lung abscess. The third of the patients who died had a perforated gallbladder. He had been treated three months previously for acute gallbladder disease and returned for treatment of the same symptoms, which had occurred for a second time. Operation was deferred, as on his initial admission, and death resulted from prolonged sepsis.

TABLE 1.—*Methods of Treatment of Acute Cholecystitis, 1934 to 1949*

		Deaths
Cholecystectomy		
A. Alone	33	4
B. With duct exploration	9	1
Cholecystostomy	31	3
Medical management only	36	3
Total	109	11
Interval Cholecystectomy		
A. Alone	17	..
B. With duct exploration	14	1
Total	31	1

The over-all mortality rate for patients treated by the aforementioned methods is 10.1 per cent, 11 of the 109 patients dying after the various treatment measures described. This death rate is in sharp contrast to the 2.7 per cent reported by Glenn [4c] from the New York Hospital, the 1.5 per cent mortality rate of Dunphy and Ross [4b] reported from the Peter Bent Brigham Hospital, the 3.6 per cent reported by Adams and Stranahan [1] from the Lahey Clinic and the 5.3 per cent mortality rate

reported by Fallis and McClure [5] from the Henry Ford Hospital. In each of these reports the low death rates are attributed to early operation, usually cholecystectomy.

In the present report it is to be noted that the trend in treatment has been away from cholecystectomy as an emergency measure, and coincident with this trend

TABLE 2.—*Trauma of the Biliary Duct*

From 1934 to 1949	
2,219	Operations on gallbladder and ducts
497	Exploration of bile ducts
60	Traumatic interruptions (12.0% common duct explored)
16	Inflammatory strictures
Trauma	
39	Seen after first operation
16	Seen after second operation
5	Seen after third operation

has come marked improvement in patient survival. It seems permissible to theorize that neither gallbladder drainage nor removal has played the leading role in the reduction of mortality but that the significant features of this progress have been improvement in recognition and medical management of the disease and our recognition that failure of prompt improvement necessitates surgical intervention and not continued speculation.

Despite improvement in the care of these patients the disease process will advance continuously in some cases and operation will become imperative. The physician will be aided somewhat in his choice of surgical measures by the age and condition of his patient and by his own skill in surgical treatment. Perhaps in the majority of instances it will be his privilege to choose either drainage or removal of the bladder at will. This choice must be based on a sound knowledge of the hazards of each procedure, the patient's response to the treatment and the late expectations of each undertaking.

The hazards of cholecystectomy alone, with or without exploration of the major bile ducts, and without regard for the presence or absence of the acute inflammatory process engendered by acute cholecystitis, require some scrutiny before this procedure can demand precedence over simple drainage. From 1934 to 1949 more than 2,219 operations were done in this hospital on the gallbladder and bile ducts (table 2). On 497 of these patients exploration of the hepatic and common bile ducts was done. Sixty of these operations were for traumatic interruption of these ducts (not effected in this clinic). There is no more tragic sequel to cholecystectomy than accidental destruction of a portion of the duct system. Whether or not this consequence may occur more readily when the bladder or the duct system is the site of acute inflammation cannot be decided. Nevertheless, cholecystectomy done at a later date on the patient not acutely ill may present less hazard to the duct system; in some patients simple drainage may be the surgical measure of necessity.

Whenever cholecystectomy has been the treatment of choice for patients with acute cholecystitis, the mortality rate associated with the procedure has been reported frequently as less than that of cholecystostomy carried out on a similar group of patients. In general, comparison of survival rates [6] from these two procedures is illogical since the simpler procedure, cholecystostomy, has been utilized almost invariably on patients too ill from their primary disease or too debilitated by age or associated disease to undergo the more extensive procedure, cholecystectomy. However, it is well to recognize, too, that many patients for whom drainage of the bladder has been selected as the best measure might well tolerate removal of the gallbladder without difficulty or complication. The decision, then, for removal or drainage of the acutely inflamed gallbladder must be based on the following two premises: (1) an estimate of the patient's ability to tolerate a general anesthetic and the trauma associated with cholecystectomy and possibly choledochostomy; (2) the accepted hazard of damage to the biliary ducts by an operative procedure carried out in their immediate vicinity in circumstances that obscure the normal anatomical picture. Cholecystectomy in any circumstance must be carried out with an acknowledgement of this hazard. The chance that such a complication will result with increased frequency when cholecystectomy is performed in the presence of acute inflammation seems very real to us. Drainage of the viscus, on the other hand, carries no such complication, is accomplished usually with ease on the more seriously ill patient under local anesthesia and should therefore be the more acceptable method of surgical treatment.

The decision to treat all patients with acute cholecystitis by operation is one which also warrants elaboration. This decision has been arrived at by the demonstration that cholecystectomy and choledochostomy in the hands of some surgeons may be accomplished with a minimum of risk to the patient's life and, by removal of the inflamed organ, make cholecystectomy at a later date unnecessary. Cholecystostomy, by the simplicity of its accomplishment and the small number of postoperative complications associated with it, may be a favored method of immediate surgical attack. Both methods presume an accurate preoperative diagnosis.

The diagnosis of acute cholecystitis may be difficult without inspection of the gallbladder at the operation table; it is certainly facilitated by operation on all patients. Evidence of preexisting biliary tract disease, so helpful in anticipating this diagnosis, often is not present before operation. One third of the patients in our present series of 109 gave no history of preceding gallbladder disease. The incidence of radiopaque calculi on abdominal survey roentgenograms was 14 per cent in this same group of patients. A palpable gallbladder, perhaps the most clearcut positive physical finding, was present in 45 per cent of patients some time in the course of their disease. Its presence made confirmation of a tentative diagnosis readily possible. In one half of these patients with a tender, palpable gallbladder subsidence occurred without operation. The failure of the serum amylase level to be elevated, in the differentiation of pancreatitis, was of little comfort. An abnormal electrocardiogram in elderly patients who already had severe cardiac disease was often of little differential diagnostic value. Finally, the fact that several of the patients in this series were operated on under a mistaken diagnosis emphasizes the point that accurate diagnosis in this disease is not always

5. Fallis, L. S., and McClure, R. D.: Surg., Gynec. & Obst. **70**: 1022, 1940.

6. Dunphy, J. E., and Ross, F. P.: New England J. Med. **242**: 359-362, 1950.

without its difficulties. For these reasons observation, not alone for correction of obvious physicochemical imbalances but also for confirmation of a diagnosis, seems important. If operation is not, then, an obligatory measure, with the only indication being a diagnosis of acute cholecystitis, the following specific indications for such an approach must be outlined:

1. The most important of these is failure of rapid and prompt regression of fever, leukocytosis and abdominal signs of acute inflammation under adequate and vigorous medical management. Resolution which is delayed in these circumstances longer than 48 hours must be speeded by operation. While it is true that perforation of the gallbladder may occur while the clinical signs of acute inflammation are subsiding, it is always apparent in the slow resolution of the process.

2. Diabetes is another indication. Control of the diabetic state is precarious in the presence of acute inflammation, and resolution of severe infection is slow and protracted. Arteriosclerotic, renal and hepatic dysfunction may be advanced in the older diabetic patient.

3. Severe cardiac and renal disease is further burdened by severe infection. Drainage of the acutely inflamed gallbladder (under local anesthesia) may be accomplished readily without injury to the cardiovascular-renal apparatus. The prompt resolution of inflammation will favor recovery and control of these abnormalities.

4. Pregnancy makes operation necessary. Two patients in this series were pregnant at the time of onset of their acute disease.

5. Twelve patients in this series were ill with serious complicating disease present prior to the onset of acute

Fig. 2.—Good visualization by contrast medium of gallbladder, and cystic, hepatic and common ducts. No calculi in ducts.

cholecystitis. Exacerbation of these concomitant disease processes should favor early correction of the acute cholecystitis.

6. Recurrent acute cholecystitis is an indication for surgical intervention. Recurrent acute episodes of cholecystitis were recorded or observed in 13 patients, one of whom had had two such preceding episodes. Three of these patients are dead, one of hemorrhage (vitamin K deficiency), one because of delay when operation was indicated and the third of cardiac failure after two drainages and finally removal of the gallbladder along with exploration of the bile duct. These deaths, occurring in one fourth of the patients with recurrent acute cholecys-

Fig. 3.—Extrahepatic ducts, cystic duct and gallbladder outlined by contrast medium. Left intrahepatic duct not seen.

titis, emphasize the necessity of early operation after recurrence of the acute attack.

7. Unremitting jaundice may necessitate operation. Twenty patients in this series had jaundice during the acute phase of their disease. This finding immediately posed the question of whether or not a calculus was present within the major biliary duct system. An answer in the affirmative obligates the surgeon to explore these ducts. We are of the opinion that choledochostomy enhances the morbidity of cholecystectomy, the chance of damage to these ducts and the mortality rate of gallbladder operations in general. Of the 20 patients with jaundice associated with acute cholecystitis, five had complete resolution of their jaundice after cholecystectomy alone without exploration of the major duct system. In another five patients the common duct was explored, and from three of these patients stones were removed. Eight patients had complete regression of jaundice after simple drainage of the gallbladder. Two patients underwent no operation; in one of these the jaundice disappeared after medical treatment alone, and in the other an "unobstructing" stone was present in the duct system at necropsy.

Thus one fifth of these patients with jaundice had calculi demonstrable within the major duct system. To explore the biliary ducts in the remaining 16 patients would seem an unnecessary extension of the operative procedure. Six patients are known to have had stones in the biliary ducts in the absence of jaundice. Since many of the commonly accepted criteria for duct exploration may be masked or minimized by the acute inflammatory process, removal of the gallbladder and duct exploration might better be deferred until roentgenologic examination of the ducts with contrast mediums demonstrates the

presence or absence of calculi. Simple drainage, followed at a later date by cholangiographic studies of the duct system (figs. 2 and 3), would solve this problem readily and without hazard to the patient. On the basis of these studies (figs. 4 and 5) either simple cholecystectomy or cholecystectomy with exploration of the duct system could be undertaken logically.

Anticipation of the course of a patient's disease is not always accurate, and methods of treatment cannot often be based on this expectation. We have been interested to note that patients whose disease has existed five or more days before their entry into the hospital almost invariably required operation. On the other hand, 58 per cent of those patients seen and treated within the first two days of the onset of disease survived without operation, while 42 per cent of those seen three to five days after onset did not require operation. Only one of the 21 patients seen five or more days after the onset of their acute disease did not require operation. Since many of these patients were treated prior to our widespread use of antibiotic agents, this disparity may not be as evident in the future.

Thirty-one patients were subjected to an interval cholecystectomy after the subsidence of acute cholecystitis. Fourteen of these patients had their common duct explored, and in five stones were present within the duct. Nineteen patients, treated by cholecystectomy after an interval, had undergone drainage of the gallbladder previously. This represents more than 50 per cent of the patients on whom cholecystostomy had been done. Twelve of the 36 patients who had undergone no prior

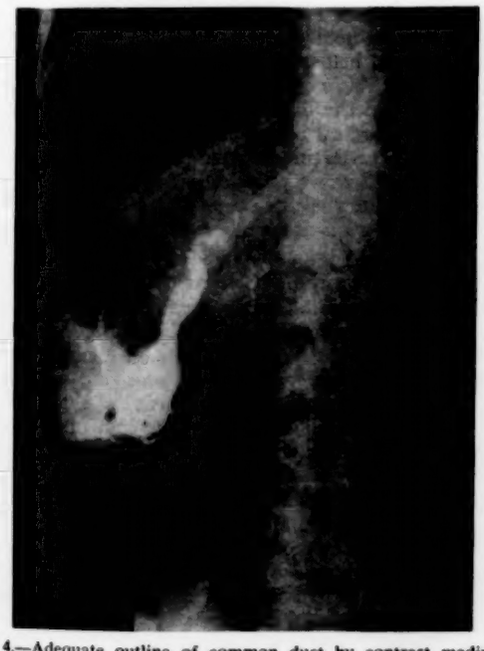

Fig. 4.—Adequate outline of common duct by contrast medium with good visualization of gallbladder and cystic duct. Surgical exploration of ducts indicated.

operation on the biliary tract also were subjected to an interval cholecystectomy.

There was one death in the group of patients subjected to interval cholecystectomy. This patient had undergone a cholecystostomy one month before removal of his gallbladder. He died of hemorrhage two days postoperatively, bleeding occurring into the peritoneum, retroperitoneal area, spleen, lymph nodes and renal pelves. Bleeding was due, probably, to vitamin K deficiency, since it occurred before our knowledge of this vitamin. The patient had had jaundice of fluctuating intensity for three years, and at operation a stone was found and removed from the common bile duct.

Fig. 5.—Cholecystogram after drainage of gallbladder. Duct system does not fill because of calculus in cystic duct. The hepatic and common ducts are not seen. Surgical exploration of ducts indicated.

Thirty-five patients did not undergo cholecystectomy either as a method of definitive surgical management of their acute disease or as an elective operation after an interval. Ten of these patients were subjected to cholecystostomy during the acute attack of gallbladder inflammation. One of these 10 patients is now dead from carcinoma of the stomach. Nine patients are alive, and only one is without symptoms of recurring gallbladder disease. None has had the gallbladder removed, but one patient has been subjected to redrainage by his physician.

In 25 patients only medical measures were used in the treatment of their acute cholecystitis. Six of these are dead of unrelated diseases. Of the remaining 19 patients, seven (36 per cent) have recurring symptoms of biliary disease.

Thus of the 35 patients treated either medically or by means of gallbladder drainage, 28 are now alive, and one half of these, or 14 patients, have varying degrees of recurring gallbladder symptoms. None has consented to cholecystectomy.

SUMMARY

There is apparently an increasing number of surgeons advising early operation on patients with acute cholecystitis and extolling cholecystectomy (and choledochostomy) as the treatment of choice. A study of a small series of patients presented here demonstrates improvement in our results to the same degree with the use of cholecystostomy and other conservative measures. The inference is that several factors, exclusive of cholecystectomy or cholecystostomy, are responsible for the progressively declining mortality rate, as follows: (1) the acceptance of prompt, early surgical therapy in the patient seen late in his disease, in the presence of severe intercurrent disease, unremitting jaundice or delayed

resolution of the acute inflammation; (2) the increasing improvement in the care of any severe infectious process, including acute cholecystitis, by more accurate fluid and electrolyte replacement, recognition and repair of vitamine deficiencies and in the liberal application of a battery of antibiotic agents to cover the full spectrum of bacterial activity. These factors, supplemented by either cholecystectomy or cholecystostomy, have resulted in a sharply declining death rate.

It must be recognized that cholecystectomy is not an obligatory procedure in the presence of acute cholecystitis and that the ease and simplicity of accomplishment of a cholecystostomy and the minimum of operative and postoperative complications associated with it are of great advantage to the seriously ill patient. In the absence of jaundice cholecystectomy may be desirable, particularly when there is acute disease of short duration. In the presence of jaundice associated with acute inflammation, calculus obstruction of the biliary ducts is difficult to verify except by surgical exploration or by cholangioroentgenographic study. After drainage of the acutely inflamed gallbladder the latter procedure is easily accomplished and of infinitely less hazard.

After the termination of an episode of acute cholecystitis treated either by nonoperative management alone or by this method in conjunction with operative drainage of the gallbladder, cholecystectomy is desirable because of the high incidence of recurring symptoms of gallbladder dysfunction.

In view of the dangers of duct injuries associated with cholecystectomy in the presence of the difficult anatomical and pathological abnormalities accompanying acute inflammation of the gallbladder and bile ducts, one should seriously consider cholecystostomy as the operation of choice whenever the acute process makes for technical difficulties. A secondary cholecystectomy under more favorable auspices is a low price to pay for an intact duct system.

ABSTRACT OF DISCUSSION

Dr. Allen M. Boyden, Portland, Ore.: The recent surgical literature has led us to believe that cholecystectomy is the procedure of choice in the vast majority of patients with acute cholecystitis. This teaching has been handed down from many surgical centers, to the extent that our present interns and residents have accepted it as the gospel truth. It is refreshing that a group as well known as Coller, Buxton and their associates is reemphasizing the conservative management of acute cholecystitis in contradistinction to the radical approach. Those of us who are particularly interested in gallbladder surgery are constantly faced with the problems that result from surgical injury to the common and hepatic ducts. Unfortunately, all of us cannot be masters of surgical technique, and it is certainly true that a majority, or at least a sizable percentage, of gallbladder operations are done in small hospitals, in small communities and not in teaching centers. To teach our medical students and interns that the gallbladder should be removed in 90 per cent of all cases of acute cholecystitis as an emergency measure is to me a warning that we can expect many more injuries to the common duct and the hepatic system than we have seen in the past. It is enlightening to find this group of investigators advocating a more conservative and individualized approach to this problem. They are still willing to do cholecystostomy in the severely ill patient with acute cholecystitis who fails to respond to the usual supportive measures. If the patient is seen early—within the first 24 hours—provided his condition is satisfactory or can rapidly be made so and provided, of course, that the diagnosis can be definitely made, it is commonly possible to perform definitive cholecystectomy and choledochostomy before edema and inflammation in the duct system are so marked that accurate visualization is impossible. After 24 to 48 hours it is our custom to approach these patients with conservatism, not with nonoperative treatment but with the hope that their disease will resolve. In this way, as Dr. Buxton has pointed out, many of the patients can await a definitive operation following resolution. Furthermore, the diagnosis in many cases, obscure in the beginning, becomes obvious as time passes.

Dr. Frank Glenn, New York: May I point out, as has been implied by the chairman, that the controversy is not as sharp as it might appear. We all have a common objective, namely, the lowering of the morbidity of complications and of the mortality rate in biliary tract disease. If we operate on a patient in an early phase of the disease, I firmly believe we may interrupt it. Certainly we may interrupt the development of the complications of acute cholecystitis such as gangrene and perforation. Of even greater importance is interruption of later complications in biliary tract disease such as common duct stone and liver damage. The clinic I represent has been accused of insisting on emergency cholecystectomy for acute cholecystitis. We have stated repeatedly that we believe operation should be embarked on when the patient has been adequately prepared and no contraindications are present. The procedure to be done is the one that in the opinion of the operating surgeon has the least hazard for that patient. This may be a cholecystostomy to tide the poor risk patient over until such time as a cholecystectomy may be done. As to the incidence of the disease, I think you will find that when it is a practice in the community to consider acute cholecystitis a surgical condition the incidence of the disease will appear greater. I am eager to see this situation exist, because if the surgeons assume the attitude that early operation is appropriate, then the internists and the general practitioners will bring those patients to the hospital rather than leave them at home, where the complications of acute cholecystitis may take place and where these complications may go on to a fatality without their being recorded. Dr. Buxton and his group feel much the same as I do about this. We have today many accessories that we did not have years ago, i. e., better anesthesia, antibiotics and improved surgical technique. These are aids to surgery and the means of a direct approach to the disease. I prefer that we continue to pursue the direct surgical approach, however, rather than rely on fluids and antibiotics in an attempt to control the disease medically. By the latter we encourage the physician as well as the patient to tolerate the disease and thus allow its complications and sequelae, such as common duct stone, liver damage and even carcinoma of the gallbladder, to develop.

Dr. Alton Ochsner, New Orleans: About 15 or 20 years ago we became convinced, largely because of the influence of Dr. Mims Gage, that acute cholecystitis in the beginning is a mechanical lesion, that it begins as a result of obstruction and that if one could operate on these persons and remove their gallbladder before they got bacterial invasion the disease would be cut short. As a matter of fact, 96 per cent of our patients in the Charity Hospital have been found to have stones in the gallbladder. At Charity Hospital we have two teaching services, the Louisiana State service and the Tulane service. The Louisiana State service for a number of years has practiced the so-called conservative treatment of acute cholecystitis. We on the Tulane service have practiced the immediate operation because we were influenced by the thinking of Dr. Gage. About four years ago we went over all the cases of acute cholecystitis in the Charity Hospital, and it was possible to contrast the results obtained on these two services. As a result of that investigation we have had to alter our thinking. I should like to disagree with Dr. Buxton and his associates on the notion that the time these patients are seen does not make any difference because we are convinced from our own experience that it does make a difference. In our service at Tulane those patients seen and operated on within the first 72 hours all did well. The mortality rate was low. From 72 hours to the ninth day the mortality rate was considerably higher, and we came to the conclusion that acute cholecystitis was not unlike acute appendicitis in that there was a time at which operation was hazardous. We have had to change our method of handling these cases. We now

believe that if we can see patients within the first 48 to 72 hours after onset of the disease, immediate operation offers them a chance of rapid recovery before there is invasion of the gallbladder by micro-organisms from the liver and when the lesion is still an obstructive one. If that can be done, the mortality and morbidity are low. If the patient is seen after 72 hours from the onset of the disease, then we feel that a conservative approach should be used and that those complications which occur, unless there is progression of the disease or unless there is jaundice, as Dr. Buxton has stated, make it far better to wait until later to operate. We would heartily agree that those patients who do require surgical treatment after 72 hours should have the least extensive operative procedure done, namely, cholecystostomy.

DR. MICHAEL E. DEBAKEY, Houston, Texas: One of the scientific exhibits by Dr. Dublin on the prognosis shows a study of the expected incidence of mortality in gallbladder disease. It is of interest to observe that the mortality was higher among the medical than among the surgical cases. This does not necessarily mean superiority of surgical treatment since there are other factors involved.

DR. DEAN K. RAY, Ann Arbor, Mich.: We, too, have been interested in the duration of this disease as it pertains to the ultimate outcome. The patients whom we have seen from one to two days after the onset of their disease have got well without operation in 58 per cent of the instances. Of those seen within three to five days after the onset of the disease, 42 per cent have recovered without operative intervention. Of those patients seen five days after onset of the disease, only one, or 5 per cent, has required no surgical intervention.

In safeguarding the patient's welfare it is well to recall that anatomical variations are many in the region of the gallbladder and the biliary ducts. Variations of the distribution and confirmation of the arteries, veins and biliary ducts in this region are almost innumerable. Obscuration of these by any pathological process, regardless of its nature, increases the technical hazard of operation in this area. In many instances the more simple operation of cholecystostomy may be the most desirable. Much has been said about the residual cystic duct stump in its relation to the postcholecystectomy syndrome. More should be said about the too short cystic ducts which occasionally result in stricture or interruption of the extrahepatic bile ducts. Another of the relatively sure methods of introducing inflammation and narrowing of the extrahepatic bile ducts is to permit the persistent accumulation of bile in the immediate vicinity. We must obviate this accumulation by adequate drainage of the area. I am sure that observation of these simple fundamentals will result in fewer patients with crippling postoperative biliary disease.

SEMEN STUDIES AND FERTILITY

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In no phase of medicine is it more difficult to evaluate etiological factors and therapeutic results than in the problem of infertility. The numerous constitutional and local conditions that can affect fertility of both the husband and the wife are so diversified that in any critical analysis it is difficult to know where to start and when to stop. Results of therapy statistically, on paper, can look impressive, but it is often questionable whether medicine and the physician have triumphed, or whether Nature and coincidence have succeeded. Superficially, it would appear that evaluation of therapeutic results in the husband can be made more readily than in the wife, since the fluctuations in seminal values are easily observed and interpreted. However, even with the present fairly comprehensive standards of semen interpretation, it is quite possible that additional factors are involved that at present are unrecognized and that may greatly affect evaluation of male fertility. It is with these precautionary remarks emphasized early that the following series of 408 infertile couples is analyzed, with particular stress on the husband, based on detailed study of close to 2,500 semen specimens. Specific problems in the wife do not form a part of this report, and excluded from this series are instances in which the wife is totally infertile as a result of such conditions as blockage of the Fallopian tubes. The wives would fit into the classification of "functional" sterility to the extent that significant structural factors either were not present or were largely corrected.

STANDARDS FOR EVALUATION OF THE HUSBAND

In recent years several arbitrary standards for normal semen have been proposed, and, as summarized by the American Society for the Study of Sterility, these include a minimum count of 60,000,000 per cubic centimeter, at least 60 per cent of the sperm initially active (after liquefaction), not more than 25 per cent abnormal forms and an average volume of 2 to 5 cc. Investigators differ, however, concerning the relative significance of various factors of the seminal picture. Williams and Simmons,[1] for example, place great emphasis on the morphological characteristics of the semen. Farris [2] believes the important single factor is the total number of actively motile cells in the ejaculate. MacLeod and Hotchkiss,[3] Weisman,[4] Michelson [5] and others believe that all factors form a composite picture, and that it is the composite picture that indicates the level of fertility.

It is my opinion that in many instances the sperm count per se is a good general index of the fertility level, since on the basis of analysis of the number of sperm per cubic centimeter in this series it was found that the average morphology and motility declined in direct proportion to the count (fig. 1). In the extremely low range of counts (1,000,000 to 19,000,000 per cubic centimeter) 94 per cent of the specimens showed abnormalities of morphology or motility, or both, whereas in the high range of more than 200,000,000 per cubic centimeter only 7.1 per cent showed any disturbance in these factors. However, this correlation of sperm count and morphology and motility cannot be taken as a general rule, and the necessity for complete study of the semen is indicated by the fact that a fairly large number of cases show subnormal

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Read before the Section on Urology at the Ninety-Ninth Annual Session of the American Medical Association, San Francisco, June 30, 1950.

1. Williams, W. W., and Simmons, F. A.: The Clinical Approach to the Diagnosis of Sterility, Urol. & Cutan. Rev. **46**: 558-570, 1942.
2. Farris, E. J.: Evaluation of Sterility Problems of the Male, J. Urol. **61**: 1099-1104, 1949.
3. MacLeod, J., and Hotchkiss, R.: Semen Analysis in 1,500 Cases of Sterile Marriage, Am. J. Obst. & Gynec. **52**: 34-41, 1946.
4. Weisman, A. I.: End Results in the Treatment of Male Infertility: Study of 316 Males, Fertil. & Steril. **1**: 216-232, 1950.
5. Michelson, L., and Michelson, R. P.: Fertility Studies of the Male in Barren Marriages, J. A. M. A. **134**: 941-944 (July 12) 1947.

morphology or subnormal motility, or both, when the count is above the normal limit of 60,000,000. In this series 158 men (38.7 per cent) had initial sperm counts that were below 60,000,000 per cubic centimeter. An additional 53 (12.9 per cent) had normal counts but had subnormal morphology or motility, or both. One hundred

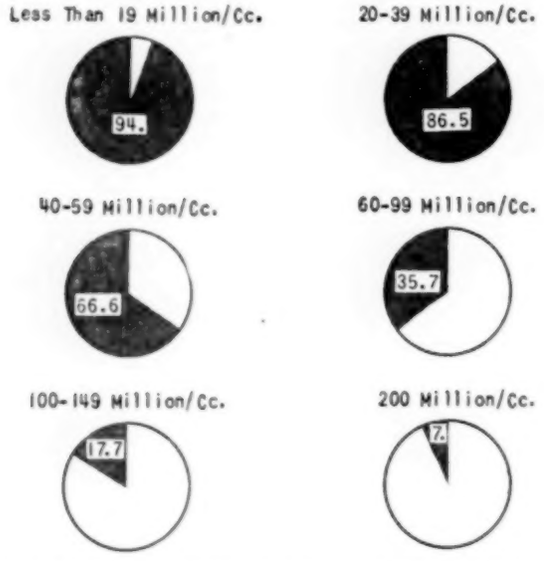

Fig. 1.—Relation of sperm count to abnormalities of morphology or motility, or both. Dark areas represent percentage showing subnormal motility or morphology, or both. Light areas represent percentage showing normal motility and morphology.

and ninety-seven (48.3 per cent) had normal semen specimens.[6] The husband, therefore, showed impaired fertility in 211 cases (51.6 per cent). In the specimens having a normal count with impairment of motility or morphology, the impairment was generally of a moderate degree. In no instance, for example, was there found a specimen with a count over 60,000,000 per cubic centimeter showing complete lack of motility. I believe that necrospermia in the presence of a normal count is extremely rare, if it occurs at all, and that when such a report is given it may most likely be attributed to collection of the specimen in a condom, to delay in examination of the semen, to rapid cooling or to some similar factor. There was one case of true "necrospermia" in which the patient had numerous counts in the range of 30,000,000, but at no time was a viable sperm observed. In two patients in this series repeatedly high counts were obtained (well over 100,000,000 per cubic centimeter), but rapid agglutination took place, so that motility was lost within 15 minutes to one-half hour after ejaculation. I have been unable to explain this type of agglutination. However, by having the patient provide specimens in beakers containing approximately 4 cc. of a mixture of Ringer's and dextrose solution, the rapidity of agglutination was impeded considerably. This may have been solely on the basis of dilution of some seminal factor that caused the agglutination.

6. With few exceptions, initial semen specimens were taken after a minimum of three days of continence, and all were obtained by direct ejaculation into a glass receptacle. In the majority of cases, at least two preliminary specimens were obtained and the higher one was considered "initial."

7. MacLeod, J.: Characteristics of Normal Semen, read before the Sixth Annual Meeting, American Society for the Study of Sterility, San Francisco June 24-25, 1950.

OCCURRENCE OF PREGNANCY AT VARIOUS LEVELS OF SPERM COUNT

In the total group of 408 couples 113 pregnancies occurred. The close correlation between defective semen and pregnancy is indicated in figure 2, which summarizes the number of pregnancies at various levels of sperm count. No pregnancies were observed in this series when the sperm count remained consistently below 20,000,000 per cubic centimeter. (I emphasize "consistently" because I believe that, in some instances in which pregnancies have been reported with the husband's semen in the extremely low range, repeated analyses might demonstrate that an occasional specimen is considerably better.) While 60,000,000 per cubic centimeter may represent a minimal normal, there was a higher percentage of pregnancies when the count was 100,000,000 per cubic centimeter or better. This may be due to a higher incidence of other abnormalities in the 60,000,000 to 100,000,000 group as compared with the group having 100,000,000 or better. Recently, MacLeod [7] reported on a series of 1,000 fertile men and showed that numerous pregnancies occurred at low sperm levels. On the basis of this he proposes that 30,000,000 sperm per cubic centimeter be considered the low limit of normal—if any arbitrary count be used at all. While undoubtedly pregnancies can occur with relatively poor semen specimens, I believe that the possibilities decrease considerably as the sperm count deteriorates, and that, if anything, the present standard of 60,000,000 is too low.

ETIOLOGY OF DIMINISHED FERTILITY IN THE MALE

Unfortunately, patients showing diminished fertility come to the physician when the end result is present, and it is frequently difficult to establish the causative factors. When azoospermia or marked oligospermia is present, physical changes in the testes may often be correlated with the patient's history to provide a reasonable diagnosis. However, in the moderate deficiencies etiology is more likely to be obscure.

Table 1 analyzes the major etiological factors found at various levels. In azoospermia and marked oligospermia (counts of 19,000,000 per cubic centimeter

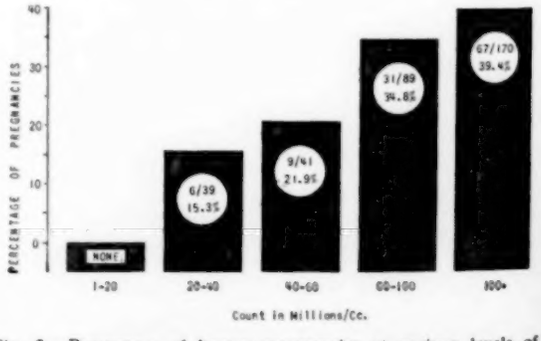

Fig. 2.—Percentage of known pregnancies at various levels of sperm count. Sperm counts shown were the best observed while couple was under investigation. In circles numerator indicates number of pregnancies and denominator number of patients treated.

or less) the most important known cause was bilaterally hypotrophic testes, presumably of developmental origin. Patients with sperm counts in the range of 20,000,000 to 39,000,000 and 40,000,000 to 59,000,000 per cubic centimeter showed a fairly high percentage of hypothy-

roidism as a known etiological factor. In the group with counts above 60,000,000 bilaterally small testes were the highest known cause, but in 67.8 per cent of the total group no specific factors could be discovered.

Most of the patients classified as having bilaterally small testes showed normal endocrine function from the standpoint of male sex characteristics, ability to perform coitus, etc. In the absence of history of mumps, trauma, Fröhlich's syndrome (adiposogenital dystrophy), or other conditions known to be associated with hypotrophic or atrophic testes, it must be assumed that these cases represent developmental anomalies or instances in which circulatory disturbances or obscure prior illness have played etiological roles.

Gonorrhea, in this series of cases, was the second commonest cause of azoospermia but only an occasional cause at other levels of infertility. The importance of gonorrhea in sterility probably is rapidly declining, undoubtedly as a result of chemotherapy and biotherapy and the lowered incidence of the disease in recent years.

"CONSTITUTIONAL" ETIOLOGICAL FACTORS

In addition to analysis of specific etiological factors, an attempt was made to evaluate data on certain "constitutional" factors that are frequently thought of as playing a role in the level of fertility. Included in this group are (1) obesity, (2) questionable diet, (3) pronounced malnutrition, (4) excessive use of tobacco, (5) excessive use of alcohol and (6) chronic fatigue. Table 2 summarizes the comparative incidence of these factors in 188 subfertile and 163 normal patients. Although pronounced malnutrition was a relatively uncommon finding, this condition appeared at almost three times the frequency in the subfertile group. Chronic fatigue was a complaint in 19.2 per cent of the subfertile, as compared with only 9.2 per cent of the fertile group. Obesity in the subfertile husbands appeared slightly oftener than in the fertile ones. (Excluded from this category are cases of obesity that belong to the Frölich type of hypogonadism and are presumably on this type of endocrine basis.) Tobacco excesses similarly occurred in a slightly higher percentage

TABLE 1.—*Etiological Factors in Subfertile Men at Varying Levels of Sperm Count*

Major Factors	Semen Level: Azoospermia		20,000,000/Cc.		20,000,000 to 39,000,000/Cc.		40,000,000 to 59,000,000/Cc.		60,000,000/Cc. or Over	
	No.	%	No.	%	No.	%	No.	%	No.	%
Unilateral cryptorchism	1	2.3	2	6.1	5	13.6	1	2.2	0	...
Bilateral cryptorchism	4	9.3	0	...	0	....	0	...	0	...
Unilateral small testis	0	...	1	3.0	4	10.8	2	4.5	3	5.7
Bilateral small testes (developmental?)	16	37.2	9	27.2	6	16.2	5	11.1	6	11.3
Mumps atrophy (unilateral)	0	...	1	3.0	1	2.7	2	4.5	0	...
Mumps atrophy (bilateral)	2	4.7	0	...	0	....	0	...	0	...
Trauma atrophy (unilateral)	0	...	0	...	1	2.7	1	2.2	2	3.8
Hypothyroidism	0	...	2	6.1	8	21.6	6	13.3	4	7.6
Significant varicocele	0	...	2	6.1	3	8.1	3	6.7	2	3.8
Gonorrhea	8	18.6	2	6.1	1	2.7	1	2.2	0	...
Cause undetermined	12	27.9	14	42.4	8	21.6	24	53.3	36	67.8
Total	43	100	33	100	37	100	45	100	53	100

While several testicular biopsies were done in this series, the observations in each particular group are not numerous enough to be statistically helpful, and it is quite possible that many cases tabulated as "undiagnosed" might have been classified more accurately if biopsies had been done. However, I have found that, despite considerable opinion to the contrary, testicular biopsy is not an entirely uncomplicated or uniformly innocuous procedure. Several patients on whom biopsies were performed had to lose considerable time from work; a few developed large hematomas that probably caused pressure on the testes and may have added further trauma to them. Because of these factors I have not been convinced that patients should routinely submit to biopsy. However, certainly in those cases of profound diminution of fertility nothing will provide as important prognostic information as a biopsy. Furthermore, biopsy is probably one of the few ways in which additional information can be accumulated about the more obscure causes of male infertility. Nelson,[7a] Simmons [7b] and others recently elaborated specific testicular syndromes on the basis of extensive biopsy studies. They report absolutely no ill effects from this procedure.

of subfertile males. Excessive tobacco usage was arbitrarily set as the smoking of the equivalent of a pack of cigarets a day, or more. Excessive use of alcohol and a questionable dietary regimen showed the smallest variations, use of a deficient diet being even more frequent in the fertile group.

No real correlation was noted between occupation (as in taxi drivers and others who sit for long periods and have excessive heat applied to the testes) and subfertility. One patient who was a welder had relatively poor specimens until he changed occupation, and this was probably a significant factor. Simmons [8] has recently emphasized that patients who are exposed to sudden changes in temperature, as well as those who wear "jockey-type" shorts, may have tendencies toward diminished states of fertility, and that elimination of these factors is of therapeutic importance.

7a. Nelson, W. O.: Testicular Morphology in Eunuchoidal and Infertile Men, Fertil. & Steril. **1**:477-488, 1950.

7b. Simmons, F. A.: Clinical Interpretation of the Semen Analysis, in Proceedings of Conference on Diagnosis in Sterility, New York, 1945, edited by E. T. Engle, Springfield, Ill., Charles C Thomas, Publisher, 1946.

8. Simmons, F. A.: The Treatment of Male Infertility, Fertil. & Steril. **1**: 193-198, 1950.

THERAPY IN AZOOSPERMIA

In the group of 43 patients showing azoospermia consistently before treatment, no improvement could be noted with any type of therapy employed. In several, biopsy specimens were obtained that showed marked testicular degenerative changes, and these patients could not be expected to respond to therapy. Two men showed

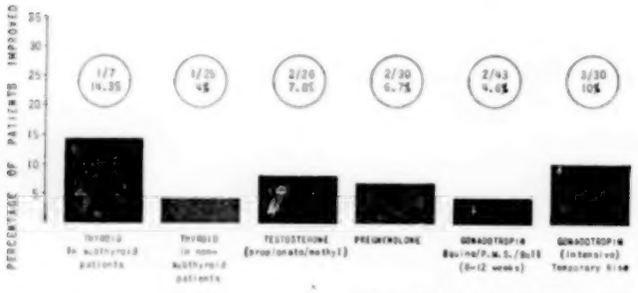

Fig. 3.—Effects of 161 courses of endocrine therapy on subfertile men with pretherapy sperm counts of less than 40,000,000 per cubic centimeter. In circles numerator indicates number of patients improved and denominator number of patients treated. The percentage of patients improved is also shown.

functioning seminiferous tubules, and the azoospermia was presumably on the basis of occlusion, but neither patient desired to consider operation. Ten patients in this group were given very intensive courses of gonadotropic therapy (with no real justification), but no sperm were found.

THERAPY IN SUBFERTILE PATIENTS

In a large proportion of the subfertile group of patients, routine study was performed to ascertain possible causative factors. This generally included complete physical examination, examination of prostatic secretions and often gonadotropic and 17-ketosteroid assays. When specific etiological factors were discovered, such as hypothyroidism, specific treatment was employed, but the majority of cases despite careful study showed no specific causes; hence a wide variety of treatment was attempted experimentally.

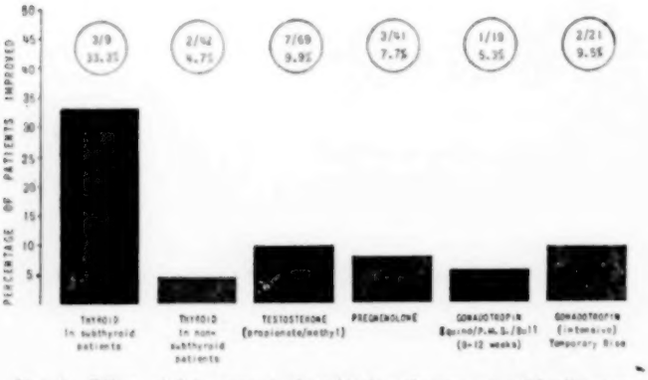

Fig. 4.—Effect of 201 courses of endocrine therapy on subfertile men with pretherapy sperm counts greater than 40,000,000 per cubic centimeter. For explanation of figures in circles, see legend to figure 3.

For the purpose of evaluating therapy, this series has been divided at the 40,000,000 mark, since responses varied depending on whether the subfertility was pronounced or moderate. In addition, therapy was classified broadly into endocrine and nonendocrine types. In evaluating results, every attempt was made to be hypercritical, and a patient was considered improved as a result of therapy only when the results of several pretherapy seminal analyses were known, and when no previous count exceeded a count made during therapy. The importance of several analyses prior to therapy, if one wishes to be objective about results, cannot be overemphasized. It has been my observation that many men vary considerably in their sperm counts with no apparent reason. Several husbands, for example, in the group that was considered fertile because of initial normal semen studies, subsequently showed subpar seminal values when specimens were used for insemination (due consideration having been given to abstinence), and possibly these should rightfully be placed in the subfertile group. However, it is probably common for many fertile husbands to have an occasional subfertile specimen. Zondek [9] believes that there is a group of men with periodic oligospermia who are accordingly subfertile. Probably the difference between the "normal" patient and certain subfertile ones lies in the frequency with which subnormal specimens are ejaculated.

TABLE 2.—*"Constitutional" Factors: Incidence in Fertile Versus Subfertile Men**

	188 Subfertile		163 Normal	
	No.	%	No.	%
Obesity	32	17.5	20	12.3
Questionable diet	18	9.6	21	12.9
Malnutrition (pronounced)	9	4.8	3	1.8
Tobacco (excessive)	48	25.5	33	20.2
Alcohol (excessive)	28	14.9	20	12.3
Fatigue	36	19.2	15	9.2

* More than one factor may apply to same patient.

ENDOCRINE THERAPY

In the patients comprising this series 362 "courses" of endocrine therapy were given, 161 to the subfertile men whose sperm counts prior to therapy were less than 40,000,000 per cubic centimeter and 201 to the group with counts above 40,000,000. These courses are not differentiated from the standpoint of patients, since the same patient may have had at different times two or more of the types of endocrine treatment involved. Results are tabulated in figures 3 and 4.

In explanation of dosage and duration of treatment, the group listed as "thyroid in subthyroid patients" receive ½ to 3 grains (0.03 to 0.19 Gm.) of thyroid daily according to general clinical findings and responses. No patient was considered hypothyroid unless adequate clinical signs were present, together with supporting laboratory data. A subnormal basal metabolic rate alone was not considered an index of subthyroidism, and many of the patients listed in the group, "thyroid in nonsubthyroid patients" had subnormal basal metabolic rates. In this group dosage was ½ to 1 grain (0.03 to 0.06 Gm.) daily. The average course (several were much longer) of thyroid therapy in this group was about 10 weeks. (According to several investigators this may not be an adequate length of time to attain results with thyroid treatment.) Testosterone was given in the form of either 10 mg. of the propionate hypodermically once weekly or 10 mg. of

9. Zondek, B.; Bromberg, Y. M., and Polishuk, Z.: Constant Oligospermia and Periodic Oligospermia, Am. J. Clin. Path. **18**:874-878, 1948.

the methyl preparation sublingually twice weekly. This low dosage was directed specifically toward improving sperm motility alone. Pregnenolone (Δ^5-pregnene-3β-ol-20-one), a steroid obtained as a by-product in the manufacture of progesterone and thought by some [10] to be a second testicular hormone, was utilized in the form of

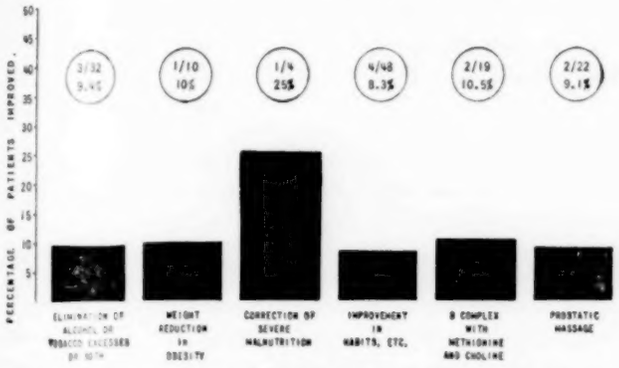

Fig. 5.—Effect of nonendocrine therapy on subfertile men with pretherapy sperm counts of less than 40,000,000 per cubic centimeter. For explanation of figures in circles, see legend to figure 3.

tablets given orally and pregnenolene acetate given intramuscularly. Orally the dose was generally 50 mg. a day. By injection the dose varied from as little as 20 mg. twice a week to as much as 100 mg. daily. The average course of pregnenolone therapy was approximately five weeks. Gonadotropic therapy involved the use of one of the following: (1) pituitary gonadotropin, an equine anterior pituitary extract presumably containing large amounts of follicle-stimulating hormone, (2) bull anterior pituitary extract and (3) pregnant mare's serum.[11] A course of gonadotropic therapy averaged eight weeks.

Some patients, however were given shorter, more intensive therapy with gonadotropins in the hope of producing a temporary rise in the sperm count at the time of ovulation. These patients received 125 rat units of equine gonadotropin daily for three to six weeks. Occasionally, such therapy will produce a decided temporary increase in spermatogenesis, particularly, as emphasized by Heller,[12] in those patients with low gonadotropic hormone assays. Precautions must be taken, however, with this type of therapy to avoid antihormone effects, and if it is employed cyclic courses are advisable.

In general, results with endocrine therapy were disappointing. The most consistent improvement was obtained with use of thyroid in subthyroid patients who had moderate seminal deficiencies. Thyroid, however, when administered empirically to nonhypothyroid patients gave poor results. Testosterone was occasionally helpful in improving sperm motility. Pregnenolone, which has recently received national attention in the lay press as an amazing new spermatogenic agent, showed no remarkable effects in this series, with only a few patients exhibiting increase in sperm motility. For the most part, treatment with endocrine preparations resulted in less than 10 per cent improvement, and, while figures in this region may be considered within the margin of experimental error, I feel that with the rigid criteria used they do represent therapeutic effects in some instances. Recently,[12a] it has been suggested that in some men with serious impairment of spermatogenesis, but with some functioning seminiferous tubules, large doses of testosterone be given to produce increased but temporary testicular damage and azoospermia. Following this severe damage, there is supposedly a period of recovery, so that in 1½ to two years spermatogenic function is greatly improved. This "last resort" type of therapy is highly speculative and requires considerable controlled study before it can be advocated.

NONENDOCRINE THERAPY

In addition to endocrine treatment, various types of nonendocrine therapy were employed at controlled intervals. This so-called constitutional therapy included (1) elimination of alcohol or tobacco excesses, (2) weight reduction in obesity, (3) correction of severe malnutrition, (4) improvement in habits, including increased exercise, more rest, etc., (5) utilization of high dosages of B complex vitamins with methionine and choline,[13] and (6) prostatic massage. In patients whose pretherapy sperm counts were consistently less than 40,000,000 (fig. 5), these measures did not effect a great change, although one patient, who had been a prisoner of war and was severely undernourished, did respond remarkably when this condition was corrected. Patients with initial sperm counts in excess of 40,000,000, however (fig. 6), showed a much higher incidence of improvement. Correction of severe malnutrition, from a percentage standpoint, gave the best results, and prostatic massage gave the poorest. Improvement in health habits helped a

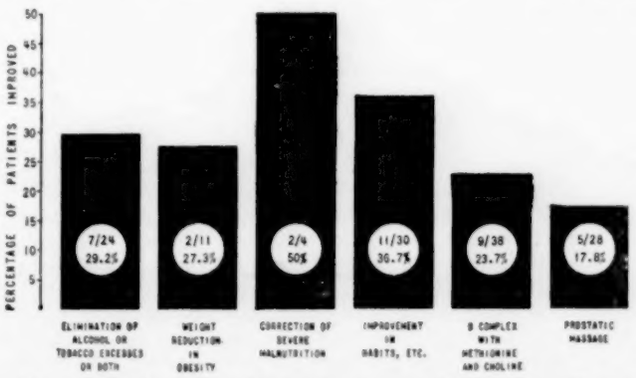

Fig. 6.—Effects of nonendocrine therapy on subfertile men with pretherapy sperm counts of more than 40,000,000 per cubic centimeter. For explanation of figures in graph columns, see legend to figure 3.

fairly large percentage of patients (36.7 per cent). Undoubtedly testicular function—particularly spermatogenic activity—is highly sensitive to fluctuations in general health. Administration of B complex vitamins with lipotropic amino acids (methionine and choline) caused improvement in motility in about 23 per cent of

10. Selye, H.: The Pharmacology of Steroid Hormones and Their Derivatives, Rev. canad. de biol. **1**:577-632, 1942. Pregnenolone and testosterone preparations were supplied by Dr. Edward Henderson and Dr. M. W. Amster of Schering Corporation, Bloomfield, N. J.

11. Dosage of equine gonadotropin averaged 50 rat units three times weekly, of pregnant mare's serum 1,000 international units twice weekly and of bull pituitary, 2 cc. three times weekly.

12. Heller, C.: Correlation of Testicular Biopsies and Gonadotropins: Their Value in Diagnosis, Prognosis and Treatment, read before the Sixth Annual Meeting, American Society for the Study of Sterility, San Francisco, June 24-25, 1950.

12a. Heller, C. G., and others: Improvement in Spermatogenesis Following Depression of the Human Testes with Testosterone, Fertil. & Steril. **1**:415-422, 1950.

13. Betolake®-lipotropic (a vitamin B complex preparation) was supplied by Dr. H. L. Daiell, of Lakeside Laboratories, Milwaukee 1.
The daily dosage of choline was 600 mg., of methionine 300 mg. and of thiamine hydrochloride 24 mg., with proportionate amounts of other B complex factors.

the patients treated. Therapy with these substances is predicated on the liver-gonad relationship, as reported by Biskind,[14] Glass [15] and others. The lipotropic factors apparently influence estrogen breakdown in the liver and may, through this mechanism, help bring about a more normal androgen-estrogen ratio with concomitant improvement in sperm motility.

COMMENT

In general, treatment of subfertile men, as evaluated in this group of 211 cases, is far from encouraging. The best results are obtained by utilizing general measures in those persons showing moderate subfertile states. Endocrine therapy, for the most part, offers only an occasional chance for improvement. This situation may change when further elaboration of the physiology and function of the testes is correlated with clinical findings by means of biopsy, hormone assays and other studies. Recently, Howard, Sniffen, Simmons and Albright [16] reported on an interesting series of cases of testicular deficiency with exhaustive and correlated data.

What, then, can be done for the subfertile man to help him produce children? Aside from attempts to improve the count per se, general instructions should, of course, be given about timing of coitus, etc. Since repeated ejaculation tends to decrease the count, coitus should be concentrated at the time of ovulation. If the husband abstains for several days prior to this time, he is more likely to have a maximal count. It has been my experience that many husbands with good sperm counts show a pronounced drop when a repeated count is taken 24 hours later. In husbands who are subfertile this drop is even more notable, and, since the viability of the egg is probably no more than 24 to 48 hours, proper timing is important.

Probably one of the most important therapeutic procedures for the subfertile man is the use of his semen for artificial insemination. In my observation a fair number of pregnancies have ensued when artificial insemination has been the only "new" addition to the management of the couple after prolonged periods of therapy of all types. I disagree with the theory that there is little value in affording the sperm a "3 inch boost on 6 inch journey." This may be true when there are large numbers of sperm, but the situation is quite different when the sperm count is marginal or less. Artificial insemination probably does more than help in the journey itself; it may insure a large enough number of sperm reaching the cervical canal when diminished concentrations are present in the ejaculate. After intercourse, despite the high buffering capacity of semen, large numbers of sperm are destroyed by vaginal secretions before they have any chance of getting near the external cervical os. Artificial insemination permits a large bulk of the semen to remain in direct contact with the cervical os; if the fluid is placed on a speculum, there is little contact with vaginal secretions and considerable contact with favorable cervical secretions. Furthermore, in recent years proposed modifications of the artificial insemination technique seem to make the procedure more therapeutically effective. One such modification involves the use of a split ejaculate from the husband. Since it has been demonstrated that approximately three fourths of the total sperm content of the semen is ejaculated in approximately the first third of the specimen,[17] the use of a split ejaculate provides a method of obtaining more concentrated specimens. The experiments of Chang [18] and others on rabbits point definitely to the conclusion that the concentration per cubic centimeter rather than the total count of a specimen is far more important in causing fertilization. Chang showed, for example, that equal numbers of sperm diluted in 0.1, 0.5 and 1.0 cc. produced wide variations in the number of fertilizations, with the 0.1 cc. concentrate being roughly 10 times as effective. Clinically the apparent relation of concentration, rather than total count, to fertility is emphasized in those subfertile males who demonstrate high total counts but low concentrations as a result af abnormal volume. I have seen several men with counts in the region of 20,000,000 to 40,000,000, with repeated volumes of over 10 cc. Patients of this type in particular are excellent candidates for artificial insemination with split ejaculate. Even in the presence of normal volume, the split ejaculate in husbands with diminished counts will permit obtaining a portion with a higher concentration that may be placed directly in contact with the cervix. The remainder can be placed in the vagina as a buffer to the vaginal secretions.

Another recent modification in the artificial insemination technique has been the use of a plastic cervical cap, as reported by Whitelaw.[19] This method involves placing the semen in a plastic cap that fits over the cervix and may remain *in situ* for six to 24 hours. The use of the cap [20] circumvents the effect of vaginal secretions on the sperm and, by maintaining constant contact of the semen with the cervical os, favors sperm migration.

An attempt was made to gain some impression of the success of artificial insemination by analyzing pregnancies that took place in the 211 cases in which the husband was subfertile. Forty-one known pregnancies occurred in this group. (In several cases, of course, pregnancy may have occurred after the discontinuance of therapy.) Eliminating the patients with azoospermia and those inadequately followed, there were 41 pregnancies in 161 couples of this group; 98 of these were treated with artificial insemination (repeated inseminations) and 63 were not. Thirty-three pregnancies occurred in those treated with artificial insemination (33.7 per cent); eight pregnancies occurred in the 63 cases in which artificial insemination was not employed (12.7 per cent). Since artificial insemination was not the only therapy used in these patients, it should not be assumed that the percentages obtained are attributable directly to this procedure. While these statistics are very limited and influenced by

14. Biskind, M. S., and Falk, H. C.: Nutritional Therapy of Infertility in Male, with Special Reference to Vitamin B Complex and Vitamin E, J. Clin. Endocrinol. **3**: 148-153, 1943; abstracted, J. A. M. A. **122**: 706 (July 3) 1943.

15. Glass, S. J.: Liver-Gonadal Syndromes as a Cause of Sterility, Urol. & Cutan. Rev. **52**: 542-586, 1948.

16. Howard, R. P.; Sniffen, R. C.; Simmons, F. A., and Albright, F.: Testicular Deficiency: A Clinical and Pathologic Study, J. Clin. Endocrinol. **10**: 121-186, 1950.

17. Hotchkiss, R. S.: Fertility in Men: A Clinical Study of the Causes, Diagnosis, and Treatment of Impaired Fertility in Man, Philadelphia, J. B. Lippincott Company, 1944.

18. Chang, C., in Proceedings of Conference on Diagnosis in Sterility, New York, 1945, edited by E. T. Engle, Springfield, Ill., Charles C Thomas, Publisher, 1946.

19. Whitelaw, M. J.: Use of the Cervical Cap to Increase Fertility in Cases of Oligospermia, Fertil. & Steril. **1**: 33-39, 1950.

20. The cervical cap is manufactured by Ortho Pharmaceutical Corporation, Raritan, N. J.

many factors, they do seem to indicate an increased possibility of pregnancy with this measure.

One inescapable conclusion can be drawn from these and other studies of male infertility. The limitations of therapeutic possibilities in the male make preventive medicine of extreme importance in this particular problem. More attention should be given by pediatricians and others who treat children to careful examination of the testes and to the seemingly minor variations in gonadal development that may ultimately result in profound disturbances of fertility.

SUMMARY AND CONCLUSIONS

Etiological factors and therapeutic results in 408 infertile marriages are evaluated chiefly from the standpoint of the husband. A total of 211, or 51.7 per cent, of the men could be classified as subfertile.

Analysis of the semen in this study demonstrates that there is a general relationship of the sperm count with morphology and motility, but that numerous patients with a normal count will show disturbed motility and morphology. This emphasizes the need for complete seminal studies.

The occurrence of pregnancies in this series increased proportionately as the sperm count approached normal. No pregnancies were observed when the sperm count remained consistently below 20,000,000, and the greatest incidence was in couples in which the husband's sperm count was above 100,000,000 per cubic centimeter.

Forty-three patients had complete azoospermia, the cause of which in approximately 40 per cent was bilaterally hypotrophic testes, presumably on a developmental basis. Other etiological factors are tabulated for the sterile patients, as well as for those with various degrees of subfertility, on the basis of the level of the sperm count.

The results of endocrine and nonendocrine therapy are reviewed. Nonendocrine therapy affords a better chance of improving the sperm counts, particularly in those patients showing borderline or moderate states of subfertility.

The generally low percentage of improvement of sperm counts obtainable with present day therapy makes it mandatory to utilize the patient's sperm potential to best advantage. This includes instructions in regard to proper timing of coitus, avoidance of intercourse at nonfertile times of the cycle and artificial insemination. Of greatest importance to the solution of the problem of male infertility today is preventive medicine in childhood.

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ABSTRACT OF DISCUSSION

DR. LEWIS MICHELSON, San Francisco: Figures below the normal sperm count do not mean that the husband is sterile, but they do mean that it is more difficult for him to produce a pregnancy than a normally fertile male. I have seen many women become pregnant whose husbands had counts of 15,000,000 to 20,000,000 per cubic centimeter and at least five cases in which the count was under 1,000,000. Two women have produced two children each when the spermatozoa count was under 500,000 per cubic centimeter. This finding, in conjunction with Dr. Tyler's observation that "no pregnancies were observed when the sperm count remained consistently below 20,000,000," points to a relative fertility that may be due to an unrecognized or still unknown incompatible factor, or factors, present in one or both spouses and preventing the production of an offspring. This factor, or factors, may account for the many apparently fertile couples in whom no conception takes place. Approximately 30 per cent of the couples who consult me because of a barren marriage come under this perplexing category. There is an important constituent of the semen that is constantly overlooked and the study of which should be emphasized. That is the spermatogenic cell. Spermatogenic cells are continually being cast off and are present in the lumen of the seminiferous tubules and ejaculated with the semen. Normally they do not exceed 0.5 to 1 per cent of the spermatozoa counted and consist mostly of spermatids. However, when this percentage is increased greatly and includes many deformed spermatids and spermatocytes, and even in some cases spermatogonia, marked degeneration of the germinal cell layers is present. The results of such a study in this greatly neglected field will aid greatly in determining the extent of the disease process of the testis. Also, in certain cases of azoospermia the finding of germinal epithelial cells in the semen demonstrate, of course, that the vasoepididymal ductal system is not completely blocked. "Endocrine therapy, for the most part, offers only an occasional chance for improvement." This sane and conservative statement in Dr. Tyler's paper gave me pause, and I believe the greatest service I can do members of this Section is to warn against the prevalent indiscriminate use of gonadotropins and androgens. The widespread practice of giving every patient who complains of infertility "shots" is to be condemned. I have seen men with absent vasa who were treated for azoospermia for months before a competent examination was made and the congenital anomaly recognized. On the other hand, organized, trained groups, such as those of Heller, Simmons, Tyler and others, who utilize the services of the clinician, the surgeon, the biochemist and the pathologist, are making real advances in helping to select the cases suitable for hormonal therapy and evaluating the results of this form of treatment.

DR. M. JAMES WHITELAW, Phoenix, Ariz.: One of the most important facts that emerged from Dr. Tyler's paper is that nearly 50 per cent of the infertility in his series was explainable on the findings in the male. Only a few years ago most of us, unfortunately, were oblivious to this point. The second fact that emerges from this paper is that over 40 per cent of cases of azoospermia were on a basis of morphological alteration in the testis presumably at the time of puberty and were not due to blockage by gonorrheal involvement. There is some indication that the changes in the basement membrane and seminiferous tubules may be an inherent defect, and these changes possibly could be classified as a collagen disease. It would be very interesting, therefore, to follow semen studies in conjunction with the work being done with pituitary adrenocorticotropic hormone and cortisone. In making a diagnosis of infertility in the male, Dr. Tyler's point is well taken; that is, it is foolish for us to make a diagnosis on the basis of only one specimen. It would be exceedingly helpful in diagnosis to take a biopsy specimen in all questionable cases. It is impossible in patients with azoospermia to differentiate normal testes with blockage from testes that are incapable of spermatogenesis. A plastic operative procedure will depend entirely on the biopsy findings. By this method the capacity of the tubules to produce both normal and pathologic sperm can also be determined. In diagnosis, in communities where it is possible, determination of the follicle-stimulating hormone and sometimes of the 17-ketosteroid titers is important because, as Dr. Tyler has again pointed out, if the titer of follicle-stimulating hormone is low, there is, for the first time, an indication for giving gonadotropins. I should like to emphasize again a point that has been repeatedly stressed and that is applicable in this age of cortisone. On removal of unilateral cortical tumors of the adrenal gland, it has been common experience to have the patient die of adrenal insufficiency the following day, and to find at autopsy atrophy of the opposite side. This phenomenon, which is known as Selye's compensatory atrophy of the adrenal gland, can be produced when one gives cortisone. Use of pituitary adrenocorticotropic hormone does not produce this undesirable effect. In other words, if you flood the body with an exogenous hormone, you may produce compensatory atrophy, because when androgens are given to a male the interstitial cells no longer need to supply endogenous testosterone. I would like to leave that one point with you, that when we are giving hormones we may produce the opposite end results from those we intend.

DR. EDWARD T. TYLER, Los Angeles: Dr. Michelson's report of noting pregnancies in instances in which the sperm counts were no better than 1,000,000 per cubic centimeter emphasizes the need for conservative prognosis in infertile cases. However, these isolated successful cases should not necessarily lead to lowering of values for normal semen. It does not seem likely that we would see so many men with counts of 100,000,000, or even 200,000,000 or better, if 30,000,000 can really be considered normal. I do not believe the human physiology has that wide a range of fluctuation; it does not have it, for example, in blood cell concentration. I am emphasizing this because, if we consider patients showing consistent counts in the range of 30,000,000 as normally fertile, we are going to overlook many subfertile men. Certainly, physicians doing inseminations would not ordinarily accept a donor with consistent counts of 30,000,000 per cubic centimeter whether he had produced a child or not. Pregnancies, of course, can occur with low semen values, but it is the degree of possibility that is important. Concerning Dr. Whitelaw's comments on biopsies, I agree they give us considerable information. Unfortunately, certain of my patients from whom biopsy specimens were taken had minor but inconveniencing complications. Possibly better standardization of the technique will avoid this. Several points were raised by other discussants in relation to comparative studies in human beings and animals. Histories of successive generations are much less readily obtained in human beings than in animals. Such data are routinely acquired but frequently one is at a loss regarding their proper evaluation. I have frequently noted histories of good immediate background, with subsequent occurrence of infertility. At the current meeting of the American Society for Study of Sterility, Stern presented a paper analyzing family histories of succeeding generations, in which he showed a tendency toward sterility on the basis of genetic composition. This study is one of the few presentations of "hereditary" sterility in human beings. The correlation of suboptimal semen with incidence of abortion in human beings is difficult. It takes a large number of cases to mean anything—far more than the average clinician would accumulate. Here again, though, we can go overboard in our interpretations. In one case, for example, in which a doctor's wife had had four abortions, the husband's semen showed consistently poor morphology, and despite various attempts at therapy no improvement in semen specimens was noted. The couple decided to try again, despite the abnormal morphology, and the fifth pregnancy was successful. A single illustration such as this means little clinically, but it serves to keep us from being too dogmatic in our interpretations and assertions.

PERSONALITY STRUCTURE IN RELATION TO TETRAETHYLTHIURAMDISULFIDE (ANTABUSE®) THERAPY OF ALCOHOLISM

Captain Paul W. Dale, Medical Corps, United States Army
and
Franklin G. Ebaugh, M.D., Denver

It was only two years ago that the Danish physicians Hald, Jacobsen and Larsen [1] announced their discovery of the sensitizing effect of tetraethylthiuramdisulfide (antabuse® [2]) to ethyl alcohol; and it was only shortly thereafter, in association with Martensen-Larsen,[3] that they told of their initial clinical experience with this substance in the treatment of chronic alcoholism.

During these two years this drug has received increasingly frequent use. In the near future we shall publish an article [4] reviewing the literature to date. Four other papers [5] on tetraethylthiuramdisulfide in the treatment of alcoholism were read at the American Psychiatric Association meeting in May 1950.

For purposes of brevity, we shall say little about the pharmacology and toxicology of this drug. It will suffice to mention that tetraethylthiuramdisulfide in some way alters the normal metabolism of ethyl alcohol, resulting in the formation of acetaldehyde in the blood stream, which creates a multitude of toxic symptoms. The principal effects are centered in the cardiovascular system. Once this reaction is experienced, the majority of persons refrain from taking alcoholic beverages; and if they should do so they would become so ill as to be prevented from continuing their drinking. Thus, tetraethylthiuramdisulfide creates a biochemical intolerance to alcohol. Of even more importance, we have noticed in many patients, depending upon the structure of their personality, the appearance of psychologic reactions to tetraethylthiuramdisulfide therapy. It is the psychologic aspects of this therapy which we should like to discuss.

These observations are presented as a preliminary report. We have had only a year's experience with this new therapy of alcoholism, and our series of cases now numbers 60. One year is but a brief time when one is considering a chronic relapsing disease like alcoholism. We feel that the patients who are "dry" to date cannot be termed therapeutic successes; rather, we should look upon them as having a remission of symptoms. It is probable that in many of these patients tetraethylthiuramdisulfide has played an important part in producing this remission. It goes without saying that there will be some relapses in those patients who at present have remissions.

This paper is a study of the emotional reactions of the alcoholic to tetraethylthiuramdisulfide therapy and of those patients who have not abstained from alcohol. These aspects are related to the personality structure of the individual alcoholic patient. We think that an analysis of the patients who have had relapses while on tetra-

From the Department of Psychiatry, Colorado Psychopathic Hospital, University of Colorado School of Medicine.

Read before the Section on Nervous and Mental Diseases at the Ninety-Ninth Annual Session of the American Medical Association, San Francisco, June 28, 1950.

1. Hald, J.; Jacobsen, E., and Larsen, V.: Sensitizing Effect of Tetraethylthiuram Disulfide (Antabuse) to Ethyl Alcohol, Acta pharmacol. et toxicol. **4**: 285-296, 1948.

2. Antabuse® was supplied for research purposes through the courtesy of Ayerst, McKenna & Harrison, Ltd., 22 East Fortieth Street, New York.

3. Martensen-Larsen, O.: Treatment of Alcoholism with a Sensitizing Drug, Lancet **205**: 1004-1005, 1948. Jacobsen, E., and Martensen-Larsen, O.: Treatment of Alcoholism with Tetraethylthiuram Disulfide, J. A. M. A. **139**: 918-922 (April 2) 1949.

4. Dale, P. W., and Ebaugh, F. G.: The Use of Antabuse in the Treatment of Chronic Alcoholism, Am. J. M. Sc., to be published.

5. Bowman, K. M.; Simon, A.; Macklin, E. A.; Anderson, H. H.; Burbridge, T. N., and Hine, C. H.: Clinical and Pharmacological Evaluations of Antabuse® (Tetraethylthiuramdisulfide) in Problem Drinkers, read before the American Psychiatric Association, Detroit, May 4, 1950. Bennett, A. E., and McKeever, L. G.: Thiuramdisulfide (Antabuse®) in the Treatment of Alcoholism, read before the American Psychiatric Association, Detroit, May 4, 1950. Epstein, N. B., and Gould, J.: Further Clinical Experience with Antabuse®, read before the American Psychiatric Association, Detroit, May 4, 1950. Osinski, W.; Childs, G. P.; Goldstein, K., and Bennett, R. E.: Therapeutic Results and Clinical Manifestations Following the Use of Antabuse®, read before the American Psychiatric Association, Detroit, May 4, 1950.

ethylthiuramdisulfide therapy will enable us (1) to make some observation concerning the psychologic implications of tetraethylthiuramdisulfide to the alcoholic, (2) to improve our therapeutic tools to be used concurrently with tetraethylthiuramdisulfide therapy, (3) to make a wiser selection of patients and (4) to improve the overall approach to the problem of chronic alcoholism, with fewer patients falling into the group who have relapses.

CLINICAL OBSERVATIONS

Psychologic Effect of Tetraethylthiuramdisulfide.—In the course of getting the patient started on treatment with tetraethylthiuramdisulfide, it is customary to give him several controlled alcohol-tetraethylthiuramdisulfide reactions in the hospital situation to allow him to become familiar with this reaction and to aid us in adjusting the proper dose. During this time, the patient experiences a situation not too different from the conditioned reflex therapy of alcoholism. In some instances this conditioning may be very marked. We have had several patients who experienced the subjective symptoms of a tetraethylthiuramdisulfide-alcohol reaction after smelling the cork, and another patient who became uncomfortable at the sight of particularly realistic billboard advertising. This conditioning effect, whether present to a greater or less degree, does not last long. None of our patients have been uncomfortable in situations where others were drinking or have experienced other than the biochemical phenomenon of the tetraethylthiuramdisulfide-alcohol reaction after a period of one month following the test trials.

In some measure, the taking of tetraethylthiuramdisulfide has symbolic significance to the patient. The taking of a white tablet each morning is evidence to the patient that he is sick, that he has sought help and that he is taking something for his sickness. This allows him to live more comfortably with himself and abolishes the rejective attitude that his marital partner, family or friends may have toward him. Thus, the significance of taking medicine, which is symbolic of illness, has its influence on the patient's acquaintances, as well as on himself.

Closely akin to this aspect of taking tetraethylthiuramdisulfide is its utilitarian value. It saves the patient many excuses when he is confronted by his drinking pals. In cases in which both the husband and the wife drink, it allows one partner to cease drinking with an adequate explanation. In this case the explanation that the patient can no longer drink is largely implicit and need not be verbalized. One who becomes ill as a consequence of drinking is not so often encouraged by others to drink. Illness is an acceptable excuse which needs no further explanation, and the alcoholic when confronted can say, "No, it makes me ill," much more easily than he can after he has received only intellectual insight.

Psychologic Effects of Alcohol Withdrawal.—Chronic alcoholism is a symptom manifestation of an underlying mental and personality disturbance. This personality disturbance may range from simple reactive alcoholism to the early stages of one of the major psychoses. In spite of this wide range, there are many aspects the various alcoholic patients have in common. In other words, it appears that the psychopathology behind the symptom formation of alcoholism is similar from patient to patient and from one diagnostic group to another. With our series, although small and representing a short experience, we have been able to detect some correlation between the diagnostic group and the psychologic effects one sees in the patient after he has been placed under treatment with tetraethylthiuramdisulfide. (The criterion for our diagnostic groups is discussed in the section on "Prognostic Implications.")

We have noted the following effects of alcohol withdrawal in the patient after tetraethylthiuramdisulfide therapy:

1. Hypochondriacal reaction. This is most pronounced in the early months after the initiation of tetraethylthiuramdisulfide therapy and appears to be the way the patient handles his feelings of inadequacy and futility. These feelings may have a large real component in that the patient is frequently "scraping the bottom" by the time he is committed to us for treatment. His being sick allows the alcoholic to continue his dependent position. We can sometimes get a hint of the probability of such a reaction by the expression of a hypochondriacal content in the Rorschach test. It may be difficult to determine what part of the complaint is hypochondriacal and what part is due to the side reaction of tetraethylthiuramdisulfide (metallic taste in mouth, lassitude, constipation).

2. Hostility. The patient, during the course of his hospitalization or shortly thereafter, or several months later, may express a considerable amount of hostility toward the physician, the hospital and the family. In addition to that hostility, usually seen in regard to the commitment to the hospital, one finds after discharge that the patient complains about all sorts of little things, both at home and during the course of his follow-up visits. The hostile patient may attempt to "drink through" the tetraethylthiuramdisulfide-alcohol reaction or may try to show his prowess by drinking even though he is taking the drug. It is these patients who wind up in the emergency room of the local hospital extremely sick, moribund, or even dead. In those whom we have talked to after they have recovered from such a reaction, it is hard to tell whether the hostility really had a focus, and we guess that much of it had been turned inward. These patients may show depressive trends clinically and in the Rorschach test.

3. Anxiety. An increase in the observable anxiety of the patient is not often present. It may be present in some patients with essential alcoholism who had begun to gain intellectual and emotional insight. When present, this anxiety can often be used to psychotherapeutic benefit and may be pressing enough for the patient to see relief in formal psychotherapeutic sessions. Such patients, it appears to date, have good durable remissions. It is, however, those patients with an underlying psychotic process who most frequently show anxiety after what amounts to the forcible withdrawal of alcohol by the use of tetraethylthiuramdisulfide.

4. Other habituations. A few patients have turned to use of barbiturates, and one turned to amphetamine habituation. Those who turn to other habituations seem to have a more serious mental disturbance than does the usual alcoholic. One patient was schizophrenic and ambulatory, and two showed a character neurosis.

5. Crusadism. By this we mean that some alcoholics on tetraethylthiuramdisulfide therapy will go out and "preach" to their friends and other alcoholics that they have found the answer, that they have been cured of their alcoholism—"if you do the same as I, you will be cured also." It seems that as long as the patient keeps up this crusade against alcoholism and the belief that he is now able to help himself, he stays sober. These patients make good members of Alcoholics Anonymous and are encouraged to join.

6. Uneventful adjustment. This represents the largest group, and more careful analysis may succeed in subdividing it. In many of our cases subsequent changes in the life patterns resulting from withdrawal of alcohol are quietly handled by the patient himself, and this handling is frequently very successful.

Chart 1 gives a diagrammatic tabulation of the number of patients showing the various psychologic reactions while receiving tetraethylthiuramdisulfide which we have

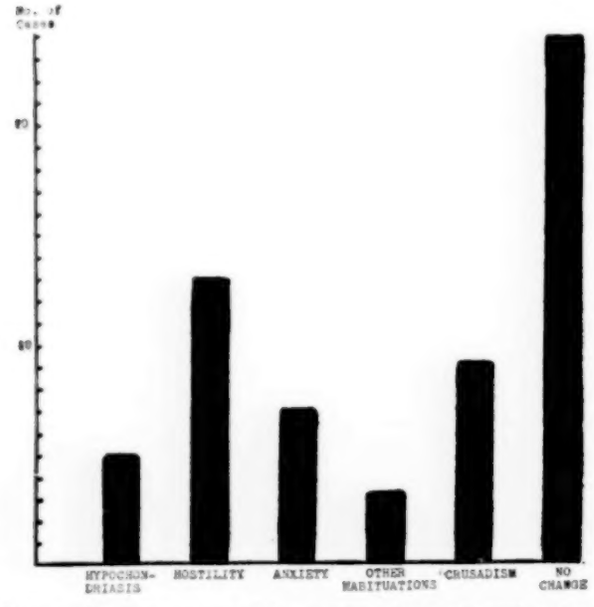

Chart 1.—Frequency of appearance of the various withdrawal reactions.

noted above. These effects are not mutually exclusive, though they are generally so. The patients with anxiety may show hostility and vice versa. However, the other withdrawal effects do not frequently appear in the same patient.

Use of Other Therapeutic Measures.—Psychotherapy: In the course of follow-up visits it is important to determine whether or not the patient would benefit by formalized psychotherapy. In the presence of anxiety the patient may sometimes ask for treatment on his own accord, but more frequently it is necessary to recommend such treatment as valuable. In the case of the hostile patient very careful handling is required, and it may be advisable to reduce the dose of tetraethylthiuramdisulfide to prevent severe alcohol-tetraethylthiuramdisulfide reactions. It is wise to watch carefully for depressive trends.

During the course of follow-up sessions, it is important not to perpetuate or to permit to become ingrained the hypochondriacal complaints that one frequently sees soon after the initiation of tetraethylthiuramdisulfide therapy. The side reactions of this drug must be watched for and controlled without arousing the drive to be ill that may be present in the patient.

Group therapy has been recommended, and it would seem to serve the same purpose and have the same meaning as group therapy among alcoholics who are not receiving tetraethylthiuramdisulfide.

At any rate, it appears that in a few cases the starting of treatment with tetraethylthiuramdisulfide may be an aid in keeping the patient working in therapy or in getting him initiated in therapy.

Environmental Alterations: An important aspect of tetraethylthiuramdisulfide therapy is handling the feelings of the marital partner or other members of the family. Up to this point, they have generally assumed either a punitive or an overprotective attitude toward the patient. These feelings can be handled by the physician in charge in a more or less direct explanatory manner, suggesting that with tetraethylthiuramdisulfide the patient will be able to take care of himself and that the responsibility of taking the drug should be left with the patient.

The social worker can be of great benefit in aiding the patient to gain employment, find friends and readjust his social life. As alcoholism is a symptom of precarious adjustment in life situations, some effort to improve the life situation may give the patient a wider margin of safety.

Those patients who on their own initiative express interest in the Alcoholics Anonymous group are encouraged to join, and the activities of this organization are supported by the physician in charge. We allow members of this group to see the patients in the ward, and we encourage their help in following the patients after they leave.

Prognostic Implications of Different Alcoholic Syndromes.—Many categories have been developed for the purpose of breaking into smaller units the large diagnostic catch basin of "chronic alcoholism." Unquestionably, chronic alcoholism is a symptom rather than a disease entity, and there may be a variety of underlying psychopathologies. For purposes of discussion, we have divided, although in some cases not without reservation, our cases into five diagnostic groups: (1) essential alcoholism, (2) reactive alcoholism, (3) periodic alcoholism, (4) character neurosis and (5) underlying major psychosis. This classification is probably no better and no worse than the other diagnostic groupings proposed to date. However, if it is understood what clinical entities have been placed in these various diagnostic groups, the point we wish to make about the prognostic implications will be clear.

The Rorschach test and the Thematic Apperception test, in addition to the clinical examination and history, are of great value in determining the personality structure of the individual alcoholic patient and enable one more accurately to classify the variety of personality disorders giving rise to the alcoholism.

1. Essential Alcoholism: By essential alcoholism we mean the alcoholism which stems from a character disorder as a result of oral frustrations and fixations, wherein alcoholism is the main expression of the neurosis.

Alcoholics of this type are the overly dependent, sensitive, insecure persons who are dominated by the parent or parental figure of the opposite sex. They seem to drink to satisfy their oral longings, to increase their convivialness, to lessen their sensitiveness and insecurity and to provide an outlet of hostility toward the domineering parental figure.

2. Reactive Alcoholism: Under reactive alcoholism we include those patients in whom, in spite of a personality structure similar to that of the essential alcoholic, the ego defenses are more adequate. These persons may show depressive features clinically and in the projective tests. They generally carry on very well, but as a result of particularly stressful situations, particularly situations of psychotraumatic importance, are apt to regress to alcoholism.

3. Periodic Alcoholism: We mean here a distinct diagnostic type, not a term descriptive of the drinking habits of the patient. Persons with periodic alcoholism bear a close relation to the manic-depressive—cyclothymic—patients, both in the expression of their illness and in their personality background. They are the overly conscientious, rigid, compulsive persons with a strong superego and subconscious guilt. Their drinking represents either a manic or a depressive episode and allows temporary relief from the overly strict superego and a satisfaction of the guilt feelings through the self-punishment that drinking entails.

4. Character Neurosis: By character neurosis we do not mean the usual degree of psychopathy with complete lack of primary identifications and warmth in interpersonal relations, although persons of this character may be admitted to the hospital with the diagnosis of chronic alcoholism; rather, we mean that condition in which, in the course of the patient's development, the parent of the same sex is psychologically absent and the parent of the opposite sex too much present, resulting in faulty superego development. Not infrequently in the case of the male alcoholic, we find that his father was an alcoholic, and thus absent as an identification figure, or that he was an overly strict, righteous person, making identification difficult. The clinical picture of these patients is characterized by complete lack of responsibility in everyday living, a superficial friendliness which is lost as soon as the narcissistic gratifications are no longer accomplished. Members of this group may have reactions to alcoholism similar to drug addiction. These patients have poor ego strengths and use alcoholism for immediate gratification. They are unable to curb their instinctual impulses in prospect of future gains and satisfactions.

5. Underlying Major Psychosi Alcohol may be the last support a person with a potential psychosis holds onto. Alcoholism may be a symptom of an underlying schizophrenic process, wherein, at the bar with drinking friends, alcohol dissolves the superego and the patient is able to hang on longer to the real world. Certainly, alcoholism is a common symptom in all the major psychoses, including schizophrenia, manic-depressive psychosis and organic deterioration.

Chart 2 summarizes the number of relapses as compared with the number of present remissions in the different diagnostic groups. Almost as one would expect, reactive alcoholism has the least number of relapses. It is interesting to note that patients falling in the group with essential alcoholism have done fairly well, while the patients with a character neurosis and particularly those with an underlying major psychosis have done poorly. Thus, it appears that in the treatment of reactive alcoholism, tetraethylthiuramdisulfide offers a temporary supportive measure, which ordinary treatment in the hospital situation would probably have accomplished anyway. It offers little to those with an underlying major psychosis. The patient with a character neurosis will usually not continue to take the drug long after leaving the hospital, and may try to drink through the tetraethylthiuramdisulfide-alcohol reaction or will discontinue the use of tetraethylthiuramdisulfide under stress situations and resume drinking. The personality disorder in the patient with periodic alcoholism appears to need direct attack through psychotherapy.

Of the patients with essential alcoholism, a fairly large number seem to be without relapse and a comparatively

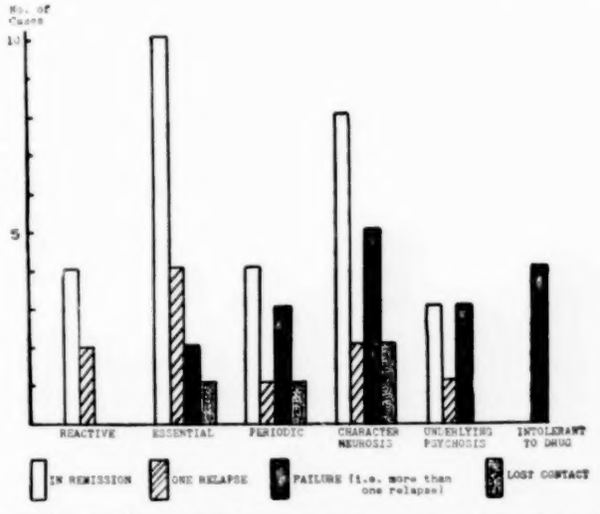

Chart 2.—Number of remissions and relapses in the various diagnostic groups.
Of the 60 patients, 29 had remissions; 10 had one relapse; for 17 treatment failed and with 4 we lost contact.

small number fail to improve. It appears that in persons with this personality structure the symbolic significance of tetraethylthiuramdisulfide achieves its major importance. These are the patients who may react to the withdrawal of alcoholism with hypochondriacal states, anxiety and crusadism. It is also the patient with essential alcoholism who seems to gain the most benefit from the psychotherapeutic handling of his hostility and anxiety, from entrance into group therapy and from help in his environmental status. We are dealing here with short term failures, and we would not hazard a guess as to the long term results. However, it appears that the patient, the family and the patient's employers frequently express considerable satisfaction with what has been accomplished, especially in patients who have had repeated and frequent hospital admissions and severe drinking bouts over the preceding years. We feel that tetraethylthiuramdisulfide is a valuable adjunct to existing therapies of chronic alcoholism. The experience so far gained will give us a rationale for the selection of patients.

Four patients were intolerant to the drug, either because of an allergic reaction [6] (dermatitis) or, in one instance, failure to become sensitized.

CONCLUSIONS

1. Tetraethylthiuramdisulfide (antabuse®) has psychologic, as well as biochemical, actions. The psychologic action is seen not only in some degree of psychologic conditioning of the patient, but in its symbolic significance and utilitarian values to the patient.

2. What amounts to the forceful withdrawal of alcohol by use of tetraethylthiuramdisulfide may result in hypochondriacal states, in increased hostility, either objectively directed or introjected, in anxiety, in other habituations, in "crusadism" or in no apparent personality changes, depending upon the personality structure of the alcoholic patient.

3. The administration of tetraethylthiuramdisulfide should be accompanied with other therapeutic measures, particularly psychotherapy, so as to avoid perpetuating the hypochondriacal state, to handle the resulting hostility and anxiety and to insure some measure of insight therapy. Environmental alterations through the social service worker are of particular value.

4. It appears that patients in the two groups—reactive alcoholism and essential alcoholism—do well under tetraethylthiuramdisulfide therapy, while the patient with a character neurosis, the patient with periodic alcoholism and the patient with alcoholism as a symptom of an underlying major psychosis do poorly. It is probable that the patient with reactive alcoholism might have recovered with only the usual management. The patient with periodic alcoholism needs psychotherapy directed toward the basic personality disturbance rather than toward the alcoholism. Tetraethylthiuramdisulfide seems to find its greatest place in that largest of all diagnostic groups, the patients wtih essential alcoholism. The number of relapses in this group, as compared with the number of patients who are sober to date, is small. Tetraethylthiuramdisulfide treatment of the patient with essential alcoholism puts less strain on existing medical facilities than did former approaches and appears to be equally as, or more, successful.

ABSTRACT OF DISCUSSION

Dr. David A. Boyd, Rochester, Minn.: Excessive alcoholic intake is only a symptom of a severe underlying personality disturbance, and the obvious presenting symptom must not be confused with the deeper psychopathology, which varies from case to case. Treatment of alcoholic patients by the use of antabuse® represents a new kind of aversion therapy, and this general type of treatment of problem drinkers has an ancient history. In medieval times an attempt was made to sicken the drinker of his taste for alcoholic beverages by saturating all his food and fluids with wine, with the hope that he would become more than satiated and disgusted with the taste of drink. More recent efforts have employed the technique of the conditioned reflex, in which the drinker is trained to become physically ill with the intake of some specific kind of alcoholic beverage. The present treatment differs, in that it adds a physiologic intolerance to alcohol to the psychologic conditioned reflex, and the reaction is directed toward any type of alcoholic beverage. As a type of aversion therapy, it has all of the benefits of previous similar treatments, but also all of the weaknesses. As outlined by the authors, excessive alcoholic indulgence is a symptom, and not the complete syndrome. Thus, it is highly unlikely that tetraethylthiuramdisulfide therapy, so long as it is directed solely against symptom removal, can solve the problem of alcoholism. In psychiatry, therapy usually fails when it is directed only toward the presenting difficulty and leaves untouched the more basic problem of personality disharmony.

It is likely that tetraethylthiuramdisulfide therapy will have all of the difficulties experienced in other types of treatment of the alcoholic patient. The motivation of the patient in undertaking therapy will be one of the important deciding factors, either for or against success. It has long been recognized that the patient who is brought under duress for treatment, or undertakes it only by reason of threats of desertion or punishment, is usually not a candidate for successful therapy. The motivation for therapy will depend on the underlying personality problem and the need the patient has for alcoholism as a defense against his underlying emotional conflicts. These considerations emphasize a basic problem in the therapy of the alcoholic patient. His pattern of alcoholism may be serving as an important defense mechanism, or even as the presenting symptom of a severe underlying neurosis or psychosis. The obliteration of the presenting symptom by aversion therapy may leave the patient stripped of his defenses, and bring about a frank neurotic or psychotic break, as the former avenue of escape into alcoholism is blocked. Therefore, it is to be expected that severe neurotic and psychotic disturbances will occur as the alcoholic habit is successfully controlled by treatment, and the authors are wise in advocating continued supervision and supportive psychotherapeutic procedures. It is quite likely that tetraethylthiuramdisulfide will eventually prove to be a valuable adjunct to the therapy of alcoholism, but it certainly will not represent a cure-all. Neither is it a blanket method of therapy, which can be applied uncritically to any patient who presents the symptom of excessive alcohol intake. In the light of present knowledge, therapy directed toward a single symptom cannot replace a broad treatment program of the total problem of the specific problem drinker.

Dr. Kenneth E. Appel, Philadelphia: Drs. Dale and Ebaugh's correlation of types of alcoholism, with therapeutic results, is most enlightening. This paper should be a great help to practitioners and should stand as a caution to many who are likely to seize on this drug as a mechanical cure-all of alcoholism. We have had some difficulty in following the authors' separation of the group with essential alcoholism from those with the character neurosis. No doubt there is overlapping. The greater number of failures in the latter group indicates they have been able to separate these two groups. It appears that the group with essential alcoholism has simpler dependence and the group with character neurosis has more unconscious conflict over homosexual identifications and tendencies and greater repressed hostility. It would be helpful for the authors to elaborate the characteristics of these two groups. Their warning that alcohol may be the last support and defense against a psychotic process is important. The avoidance of alcohol, as a result of tetraethylthiuramdisulfide treatment, may release a psychotic depression which may eventuate in suicide, as has happened. The drug is not a cure-all, a specific. There are medical contraindications to its use.

Psychologically, the use of tetraethylthiuramdisulfide involves seven functions: 1. It is a daily, repeated indication, in the (ritual) taking of the pill, that the patient is sick, accepts this fact, faces it and is willing to do something about this reality situation. 2. It is a symbol of authority. 3. It stands as a threat of punishment and suffering. In these respects it reinforces the ego ideals and superego of the patient. 4. It preserves the dependent needs of the patient, in the authoritative relationship with the doctor, with his direction, guidance and support. 5. For the patient, with his weakened ego, it is a substitution of reality support from the doctor for his alcoholism. 6. The use of tetraethylthiuramdisulfide has a relation, also, to the psychology of magic, in dealing with insecurity, wish fulfilment and fear. 7. Successful treatment involves, ultimately, the incorporation of this security obtained from the doctor into oneself, so that the patient can carry on, on his own, without dependence on the drug and the supervising relationship of the physician.

6. Lewis, H. M., and Bremers, H. H.: Fixed Drug Eruption from Tetraethylthiuram Disulfide (Antabuse), J. A. M. A. **142**: 1141 (April 15) 1950.

Thus, tetraethylthiuramdisulfide is not merely a medical cure for alcoholism; it involves complex psychologic mechanisms. It points to the need of simultaneous and further psychologic treatment to strengthen the personality of the patient, who has made a start in the reorganization of his personality forces by the use of antabuse.® General practitioners who use this method of treatment should bear in mind these psychologic factors which are important in its use; otherwise, a good start in the treatment of the extremely difficult problem of alcoholism is in danger of being rendered ineffective.

DR. FRANKLIN G. EBAUGH, Denver: The main motivation in the presentation of our paper was to point out that antabuse® therapy creates psychological reactions to the physiological inability to drink, and, second, that certain groups of alcoholics, depending on the personality structure or diagnostic category, do not do well. This information, we hope, will be useful in the selection of patients for this type of therapy. I appreciate the splendid discussion by Appel and Dr. Boyd. We are in complete agreement with the content of their discussion. We have been fortunate, perhaps, because our group is small and has been carefully screened. In Colorado, there are several groups of Alcoholics Anonymous; the only one which has been enthusiastic and has cooperated with us has been the Denver group. The main reason that they have cooperated with us has been that we invite the officials to take part in our regular group therapy sessions for alcoholism.

TREATMENT OF ALLERGIC DISEASE OF THE BRONCHI

Ben F. Feingold, M.D., San Francisco

On the basis of allergic tissue changes one can interpret the factors responsible for the signs and symptoms of allergic bronchial disease and evaluate the various therapeutic measures available for their control. In the pathology of allergic diseases two types of tissue changes are observed: (1) the reversible and (2) the irreversible.

REVERSIBLE TISSUE CHANGES

The reversible tissue changes, which are induced by such antigens as pollens, epidermals, foods, serums and drugs, are characterized by edema, smooth muscle spasm and stimulation of glands. Only the conducting portion of the lungs or bronchial tree is affected by the reversible tissue changes that account for the signs and symptoms of bronchial allergic disease.[1]

Edema of the peribronchial tissues produces rigidity of the bronchial tree that interferes with the normal expansile and contractile movements of these structures,[2] while swelling of the mucosa encroaches on the lumens, which are also narrowed by smooth muscle spasm. These factors, combined with the increased production of mucus resulting from stimulation of glands, create varying degrees of obstruction, which is the basic disturbance in bronchial allergic disease.

Bronchial asthma and those conditions that are frequently termed "allergic bronchitis" and "asthmatic bronchitis" are fundamentally variations of allergic disease of the bronchi provoked by such allergens as pollens, epidermals and foods. In each instance the tissue changes are identical, but variations in the degree of reaction explain the differences in the clinical picture. Obstruction is the dominant feature in every case, while the degree of obstruction determines the signs and symptoms in each clinical pattern.

The term "asthma," in the dictionary interpretation, means labored respiration. So, actually, in the literal sense, one should apply the term "bronchial asthma" to all allergic bronchial disease associated with any degree of impaired breathing. However, through usage the term "bronchial asthma" has become identified with a specific clinical picture characterized by paroxysmal attacks of dyspnea due to bronchial allergic disease.

The failure to recognize that the clinical pictures so frequently labeled "allergic bronchitis" and "asthmatic bronchitis" are variations of bronchial asthma may result in mismanagement in treatment. These terms have been applied interchangeably to conditions of those children offering a history of frequent "colds," with recurrent or persistent cough accompanied with the lung findings of rhonchi, coarse rales and usually a variable degree of wheezing but only slight or no respiratory embarrassment. The temperature is normal or moderately elevated, except in those diseases ushered in by an acute upper respiratory tract infection, when there may be an elevation—often as high as 103 to 104 F. The term "bronchitis," which means inflammation of the bronchi, implies that the factor of infection plays a causative role in the tissue changes and misleads the clinician from the realization that these children are experiencing an expression of allergic disease of the bronchi due to such commonly recognized allergens as pollens, environmental factors and foods, while infection contributes only secondarily.

It would be advisable to delete from the literature the terms "allergic bronchitis" and "asthmatic bronchitis" and to substitute the name "bronchial allergic disease," which more accurately connotes the causative factors and the mechanism.

If allergic disease of the bronchi is caused by such allergens as pollens, epidermals and foods, the first step toward definitive control of this disease is to determine the specific factors concerned. This is accomplished by taking a thorough, complete and accurate history dating back to the initial onset of any signs or symptoms of an allergic nature. The relation of the ailment to all possible environmental influences should be elicited; any seasonal variation of the complaint should be determined and the influence of various food items accurately estimated but not overemphasized. Foods may be important agents in the production of allergic disease of the bronchi, but they do not deserve the emphasis they have received in the literature of the past, particularly at the expense of the more important inhalant factors. A complete history is

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Read in a Joint Meeting of the Sections on General Practice and Pediatrics at the Ninety-Ninth Annual Session of the American Medical Association, San Francisco, June 30, 1950.

1. Feingold, B. F.: Respiratory Allergy in Children: Round Table Discussion, American Academy of Pediatrics, San Francisco, Nov. 16, 1949.

2. Warren, S., and Dixon, F. J.: Antigen Tracer Studies and Histologic Observations in Anaphylactic Shock in the Guinea Pig. Part I, Am. J. M. Sc. **216**: 136 (Aug.) 1948. Dixon, F. J., and Warren, S.: Antigen Tracer Studies and Histologic Observations in Anaphylactic Shock in the Guinea Pig. Part II, ibid. **219**: 414 (April) 1950.

complemented with skin testing, results of which must correlate wtih the facts of the anamnesis to be of value. Skin testing that does not support the details of the history is of no value. The offending factors that have been determined should be eliminated from the diet and the environment, and in those cases in which adequate environmental control cannot be effected, as frequently occurs in the presence of pollen and epidermal agents, desensitization with a specific antigen should be instituted.

If obstruction is the cause of the signs and symptoms of allergic disease of the bronchi, the basic principle for palliative therapy should be relief of the obstruction. This is accomplished by those procedures and drugs that relieve edema, relax bronchospasm and facilitate the liquefaction and absorption of mucus.

RELIEF OF EDEMA AND BRONCHOSPASM

Sympathomimetic Drugs.—Of the various sympathomimetic drugs recommended for the treatment of allergic disease of the bronchi, only epinephrine, ephedrine and phenylpropanolamine (propadrine®) have a vasoconstrictor action in addition to their ability to relax bronchospasm.[3] Since edema of the peribronchial tissues and the mucosal lining of the bronchi contributes appreciably toward the production of obstruction, with the resulting symptoms, it is desirable that the medication employed should influence this phase of the pathological picture.

Such drugs as isopropylarterenol (isuprel®),[4] isopropyl-epinephrine (aludrine®) and orthoxine,[5] which exhibit a strong bronchodilator effect but no vasoconstrictor action, cannot influence the edema of allergic bronchial disease. Isopropyl-epinephrine actually produces vasodilatation which could predispose one to an aggravation of edema with its resulting influence upon symptoms.

Of the sympathomimetic drugs, epinephrine has the rapidest and strongest bronchodilator and vasoconstrictor actions, but because of the comparatively brief duration of its effect the usefulness of epinephrine is limited to the acute asthmatic episode. It is important to administer the drug in adequate dosage, 0.3 cc. to 0.5 cc. subcutaneously, in order to obtain the full benefit of its vasoconstrictor and bronchodilator actions and also in order to avoid the vasodilatation that is manifested following the administration of small doses. Epinephrine can be repeated in rapidly successive doses without loss of effectiveness.

Ephedrine: Ephedrine hydrochloride or sulfate is employed to prevent the occurrence of acute episodes and to treat mild attacks of allergic bronchial disease. It is administered by mouth in doses of ⅛ grain (8 mg.) to children 1 year of age and under and in doses of ¼ grain (15 mg.) to older children. The drug should not be repeated too rapidly, as the effects of ephedrine diminish with each successive dose. Ephedrine, through stimulation of the higher centers, may produce the unpleasant side effects of jitteriness, nervousness and wakefulness. These can be counteracted by combining the drug with small doses, ⅛ grain (8 mg.) to ¼ grain (15 mg.) of phenobarbital. The barbiturates, because of their depressing action on the respiratory center, should not be used alone.

Phenylpropanolamine: This drug exhibits both vasoconstrictor and bronchodilator actions without stimulation of the higher centers. When ephedrine is not tolerated propadrine may be substituted.[3]

The Antihistaminic Drugs: The drugs of this group are reported to have both vasoconstrictor and bronchodilator functions. Despite these actions most clinicians have had disappointing experiences with the antihistamines in the treatment of allergic bronchial disease, including bronchial asthma. Owing to their mildly atropine-like effect the antihistamines may aggravate the picture of allergic bronchial disease by drying secretions.

The Xanthine Drugs: The drugs of this group, alkaloidal caffeine, theophylline and aminophylline, have of recent years enjoyed popular use in the treatment of allergic bronchial diseases. They owe their effectiveness to their bronchodilator action. Although the xanthines do exhibit a vasoconstrictor effect, in therapeutic doses the peripheral vasodilator action predominates. This action may aggravate edema. Theophylline is commonly combined with ephedrine and phenobarbital as an antiasthmatic for the mild attack. Theophylline ethylenediamine, or aminophylline, is administered orally in doses of 1½ grains (0.1 Gm.) or by suppository (0.3 Gm.). It can also be given intravenously for the acutely asthmatic patients, especially when they are refractory to epinephrine (adrenalin®).

Regardless of the route of administration, any xanthine drug may produce gastric irritation with the symptoms of nausea and vomiting. I have observed frank gastric bleeding after the administration of a single aminophylline suppository.

RELIEF OF MUCUS

To combat the ill effects of mucus in the bronchi in allergic disease, the most valuable measure is hydration of the patient. The importance of forcing large quantities of liquids cannot be overemphasized, yet the value of this simple measure has not been stressed adequately in the literature. Water is the best of all expectorants. In the absence of an adequate fluid intake none of the medicinal expectorants is effective. Hydration produces liquefaction of mucus and prevents inspissation and thickening that lead to plugging and obstruction of the bronchi, with a persistence or even an aggravation of symptoms.

It may seem paradoxical to emphasize the importance of giving large quantities of fluids—1,000 or even 2,000 cc. in 24 hours—in a disease in which tissue edema plays such an important role in the production of symptoms, but clinical experience has consistently demonstrated, frequently with dramatic response within a matter of hours, the benefit of such therapy. When persistent vomiting occurs or when children with allergic bronchial dis-

3. Goodman, L., and Gilman, A.: The Pharmacological Basis of Therapeutics, New York, The Macmillan Company, 1946, p. 396.

4. Krasno, L. R.; Grossman, M., and Ivy, A. C.: Inhalation of Norisodrine Sulfate Dust, Science **108**: 476, 1948; The Inhalation of Norisodrine Sulfate Dust, J. Allergy **20**: 111 (March) 1949. Segal, M. S., and Beakey, J. F.: Management of Bronchial Asthma, Ann. Allergy **5**: 317 (July-Aug.) 1947. Gay, L. N., and Long, J. W.: Clinical Evaluation of Isopropyl Epinephrine in Management of Bronchial Asthma, J. A. M. A. **139**: 452 (Feb. 12) 1949. Gilman, A.: The Pharmacology of Drugs Used in Allergic Conditions, J. Allergy **19**: 281 (Sept.) 1948.

5. Graham, B. E., and Cartland, G. F.: Some Comparative Pharmacological Actions of Beta-Hydroxy and Methoxy Phenyl-n-Propylamines, J. Pharmacol. & Exper. Therap. **81**: 360 (Aug.) 1944. Graham, B. E., and Kuizenga, M. H.: A Pharmacologic Study of Ortho-Methoxy-Beta-Phenylisopropyl Methylamine Hydrochloride, and Thirteen Related Methoxy Analogues, J. Pharmacol. & Exper. Therap. **94**: 150 (Oct.) 1948.

ease do not respond to fluids by mouth, 5 per cent dextrose in plain water should be administered. Of the various expectorant drugs available, saturated solution of potassium iodide is the most effective. This can be administered in doses of 5 to 10 grains (0.30 Gm. to 0.60 Gm.) three times daily, depending on the age of the child. Diluted hydriodic acid syrup and ammonium chloride are less effective than potassium iodide as expectorants. The opiates and the sedative cough mixtures are contraindicated in all forms of allergic bronchial disease. Their suppression of the respiratory center, the dulling of the cough reflex and the drying of secretions may lead to plugging of the bronchi, with an aggravation of symptoms.

IRREVERSIBLE TISSUE CHANGES

The irreversible, or fixed, tissue changes, which are induced by such antigens as bacteria, bacterial products, serums and drugs, are identified with death of cells and vascular damage. In the lungs such tissue alterations affect the respiratory portion of these organs, which includes the parenchyma, the alveolar ducts and the terminal bronchioles.[1] Alteration of these structures by irreversible tissue changes explains the pulmonary involvement observed in periarteritis nodosa, rheumatic disease and recurrent or malignant Löffler's syndrome.

A history of either bronchial asthma or of respiratory difficulty of a lesser degree with rhonchi, coarse rales and wheezes in the lungs, accompanied with an upper respiratory tract infection has been responsible in great measure for such terms as "asthmatic bronchitis," "allergic bronchitis" or "bacterial asthma." The implication in each instance is that bacteria or bacterial products are the causative agents for the allergic state. This impression results from the failure to recognize that infection plays a dual role in allergic disease.[6] First, infection may produce tissue hypersensitivity with irreversible tissue changes characterized by death of cells and vascular damage. In the lungs such tissue changes are limited to the respiratory portion of these organs and cannot explain the symptomatology of allergic bronchial disease, including bronchial asthma. Second, infection may influence the course of existing allergic disease due to such antigens as pollens, epidermals and foods, which produce reversible tissue changes that involve the bronchial tree and account for the signs and symptoms of allergic bronchial disease, including bronchial asthma.

When infection does influence the course of existing allergic disease, it produces a distinct pattern for the infection. The pattern is one of two types, depending on the nature of the infection. The first pattern is observed in association with pertussis and the viral diseases. During the period of invasion of these diseases there is an aggravation of the allergy. As these diseases approach their climax, the symptoms of allergy decrease in severity so that, at the fastigium, the allergy is suppressed. With convalescence there is a recrudescence of the allergy. The second pattern is observed in bacterial infections of the upper respiratory tract, including nasopharyngitis, tonsillitis, adenitis, sinusitis and also otitis media. In these diseases the symptoms of allergy are aggravated at the peak of the infection. As the infection improves, the symptoms of allergy improve. The aggravation of the symptoms of allergy and their improvement as the acute infection subsides have led to the belief that infection is the cause of the underlying allergic disease. But the coexistence of infection and allergic disease of the bronchi should not be interpreted as bacterial allergy. Infection is only an influencing agent and not the cause of the bronchial allergy disease.

The recognition of the role of infection is important in the management of allergic disease of the bronchi. For the child with a history of recurrent pulmonary symptoms of allergic disease accompanied with an upper respiratory tract infection, definitive therapy is achieved by controlling the food, epidermal and pollen factors that cause the allergic disease. This is accomplished by elimination of the offending agents and by specific desensitization for the pollen and epidermal agents when indicated. Vaccines, either stock or autogenous, are of no value in the management of these cases. Through successful control of the allergic state, these children may suffer an upper respiratory tract infection but without the pulmonary manifestations of allergy. Furthermore, adequate control of the allergy decreases the frequency of such infections or prevents their occurrence entirely.

For control of the acute symptoms in this syndrome, therapy in the form of the sulfonamides or of the antibiotics is directed against the infection. As the infection improves, the symptoms of allergic disease also improve.

COMPLICATIONS OF ALLERGIC BRONCHIAL DISEASE

Dehydration is the most important predisposing factor in the production of the complications of allergic disease of the bronchi. In dehydration plugs are formed by the thick, dry, tenacious secretions that may completely obstruct the air passages, resulting in the atelectatic areas responsible for the syndrome described as allergic bronchopneumonia.

The most valuable prophylactic measures against bronchial plugging are an adequate fluid intake and iodides—the latter preferably in the form of saturated solution of potassium iodide. When complete obstruction of a bronchus does occur the early administration of epinephrine hydrochloride 1: 1000 hypodermically and of intravenous water with 5 per cent dextrose are the most valuable measures to effect release of mucus plugs. Occasionally, vomiting induced by syrup of ipecac may be effective in expelling plugs from the bronchi. Failure to relieve the obstruction results in pneumonitis from superimposed infection. With pneumonitis, specific therapy in the form of antibiotics must be directed against the infection.

Status asthmaticus, or persistent asthma that fails to respond to the usual management for this disease, is not commonly observed in childhood. When it does occur it is usually due to dehydration, resulting either from an inadequate fluid intake or from the dehydration rapidly induced by infection in childhood. In most instances, an immediate response will be observed following the intravenous administration of 5 per cent dextrose in plain water. When epinephrine is ineffective, after intravenous therapy with dextrose 5 per cent and plain water, a good response to the drug will be observed.

For restlessness small doses of phenobarbital are indicated. In some cases 10 grains (0.6 Gm.) of chloral

6. Feingold, B. F.: The Influence of Acute Infection Upon the Course of Allergy in Children, J. Pediat. 34: 545 (May) 1949; Infection in Allergy, to be published.

hydrate in 2 fluidounces (60 cc.) of water as a retention enema is an effective sedative.

Cyanosis.—The presence of cyanosis in allergic bronchial disease indicates either atelectasis or infection or both. The same basic principles of therapy are applicable—adequate hydration, expectorants in the form of iodides and specific therapy for infection. For cyanosis and labored respiration, oxygen therapy is indicated.

Fever.—Low grade fever, with temperatures between 100 and 101 F., is commonly observed in uncomplicated allergic bronchial disease. High fever that ushers in an attack of allergic bronchial disease usually indicates the presence of infection as a precipitating agent, while sudden temperature as high as 104 to 106 F., occurring during the course of allergic bronchial disease or bronchial asthma, suggests the complication of allergic bronchopneumonia.

SUMMARY

Involvement of the bronchial tree by reversible tissue changes induced by such antigens as, pollens, epidermals and foods explains the signs and symptoms of allergic bronchial disease, including bronchial asthma.

Bacteria and bacterial products induce irreversible tissue alterations that affect the respiratory portion of the lungs: the parenchyma, alveolar ducts and respiratory bronchioles. Such alterations explain the signs and symptoms of rheumatic pneumonitis, the pulmonary involvement of periarteritis nodosa and chronic Löffler's syndrome.

Definitive treatment for allergic bronchial disease is achieved by controlling the pollen, epidermal and food factors that may be responsible agents and by specific desensitization when indicated.

Palliative treatment for allergic bronchial disease consists in the relief of obstruction by those procedures and drugs that relieve edema, relax bronchospasm and facilitate the liquefaction and absorption of mucus.

The role of infection as an influencing agent in allergic bronchial disease is pointed out.

Therapy of the common complications of allergic bronchial disease is indicated.

Permanente Foundation Hospitals, 515 Market St.

ABSTRACT OF DISCUSSION

Dr. Ralph Bowen, Houston, Texas: I should like to add a note of optimism. Fifty per cent of these children lose their major allergies during the adolescent period. However, it behooves us to do everything possible, since when these children are first seen, no one knows whether the child is a candidate for trouble up to adolescence or if his symptoms may persist. These children in the majority of cases will become true bronchial asthmatic patients during their preschool years. In regard to infection and its role in allergy: when children in my care have a temperature of 103 or 104 F. and are coughing, sneezing and wheezing, I am sure these symptoms are not due to pollens, environmental factors and foods. These children are in distress because of bacterial, viral or meteorologic factors. Moreover, they do not follow the pattern outlined by Dr. Feingold in that, when they have upper respiratory tract infections, the symptoms of allergy are not necessarily aggravated at the peak of the infection, and that as the infection improves the symptoms of allergy in my patients often do not improve. Oftener, my patients will have an acute tonsillitis, otitis media with fever and leukocytosis, and about the time the tonsils or ears are normal and the child is afebrile the bronchial symptoms develop and may persist for weeks in spite of anything except a change of weather. In two families who have three children all under 8 years of age all three are asthmatic. Usually these children can eat practically all foods during the summer, but let winter come, and in spite of elimination diets and hyposensitization, the eldest child usually brings home a cold and the rest go over like a set of dominoes. I appreciate the importance of food allergy, but I have not been able to withdraw specific foods and prevent infection or to influence the shrinkage of tonsillar tissue as has been reported. In a survey of 473 asthmatic children, it was found that 76 per cent had had their tonsils and adenoids removed before being referred. Of this group, 14 of the most challenging patients were selected, and an equal number were used as controls. The first group received 2 to 4 cc. of immune serum globulin (human, venous type) every month for five months; also, 0.05 cc. intradermally each week. In the "globulin group" we had much less respiratory infection than in the controlled study. Dr. Harry S. Bernton, of Washington, D. C., has conducted this same procedure, and he, too, feels that it has helped a group of asthmatic children who had failed to respond to all other approaches. In all cases the routine management was continued with both groups. I agree with Dr. Feingold that vaccine therapy is primarily empirical and worthless and that skin testing with vaccines is contraindicated. We need better testing materials. The present inhalant group and other environmental offenders are confirmatory in high incidence, but the present food antigens are another story. In all good antigens there remain too many false positives. Certain foods have a tendency to give false positives. Beware of false positives and remove from your food-testing trays the antigen cottonseed—since it has been responsible for fatalities in some doctors' offices. It has also been shown that a positive skin test for cottonseed does not justify the exclusion of cottonseed oil products, since such contain no protein. In many cases food rotation has been of benefit. I have observed that children who perspire excessively while asleep and some whose pupils are widely dilated tolerate drugs poorly because of an overactive nervous system. I rarely give more than 4 minims (0.25 cc.) of epinephrine, and I repeat this every 20 or 30 minutes till it has been given four times. I have found the inhalation units of 1:1,000 epinephrine to be useless in children under 6 years of age. They provoke too much drying of the throat. I agree with Dr. Feingold about the antihistamines. However, I have seen a few patients experience some benefit from them. In a recent poll 36 allergists preferred tripellenamine (pyribenzamine) hydrochloride or prophenpyridamine (trimeton) for day use and diphenhydramine (benadryl®) hydrochloride for night use. The present inclusion of ephedrine in treatment may also be of benefit to some. Morphine sulfate and meperidine (demerol®) hydrochloride are to be excluded. Theophylline ethylene diamine, or aminophylline, a most heralded drug on occasion, should always be given slowly and never subcutaneously because of the exquisite pain. In the case of two infants in whom the rectal suppositories were used, wakefulness and excitability resulted. If the suppository is not available, one can take a 10 cc. vial containing 3¾ grains (0.25 Gm.) of aminophylline and add 20 cc. of water, thus affording a "rectal cocktail." Dr. Feingold has rightly stressed fluids. He urges dextrose solution and not saline, since there is already sodium chloride retention. We have also encouraged the drinking of carbonated beverages. We prefer not to give antibiotics orally, since the incidence of urticaria has been higher by this route. Next year the literature will be full of reports on the use of pituitary adrenocorticotropic hormone (ACTH) and cortisone in the field of allergy. May I sound a warning that we still have to learn how to use them? Cushing's syndrome is an easy possibility. On one of our patients to whom pituitary adrenocorticotropic hormone was given for periarteritis nodosa, the necropsy revealed the adrenal gland to be nearly gone. We shall all agree that in chronic disease an emotional pattern is always to be considered. However, this does not explain "community asthma" or account for the fact that three children in the same family came down with asthma on the same night. A 3 months old infant is not wheezing because of maternal rejection. I congratulate Dr. Feingold on bringing this serious problem of allergy before our group. The families of these children should be discouraged from moving to other localities in the hope of changing the outlook, for bronchial allergic disease prevails everywhere.

DR. ALBERT H. ROWE, Oakland, Calif.: I shall limit my discussion to the regularly recurring attacks of bronchial asthma usually initiated by nasal symptoms and at times associated with fever. The nasal symptoms, especially when fever is present, suggest to parents and physicians infection as the cause of the asthma. Usually, however, they are due to atopic allergy in the nasal tissue that, in a few hours or one or two days, descends into the lungs, causing allergic bronchitis or asthma. The probable explanation of the termination of the attack in two to six days is the exhaustion of the reacting bodies in the nasobronchial tissues; afterward the causative allergens can be eaten or inhaled for days or weeks until the reacting bodies reaccumulate up to the reacting threshold. If these reacting bodies are not entirely exhausted during the attack, then mild nasal or bronchial symptoms continue between the attacks. The regularity of recurrence of these attacks is due to the approximately equal time necessary for these reacting bodies to reaccumulate. Food allergy in our experience is the usual cause of such recurrent attacks; inhalant and infectant allergy are rare causes. The determination of food allergy usually necessitates diet trial for which our cereal-free elimination diet is most valuable. This diet is modified by exclusion of foods giving definite scratch reactions or of those that the patients definitely dislike or cannot tolerate. The importance of excluding all cereal grains along with milk, eggs and other frequently allergenic foods must be stressed. The time necessary for use of such diets varies with the frequency of attacks. Thus, if an attack occurs every three or four weeks, the diet must be continued until the symptoms are absent for two or, better, three times as long. After relief of the patient, individual foods can be added, excluding those that reproduce symptoms.

It is important to realize that inhalant allergy may complicate food allergy. In many patients, however, food is the sole cause. Such extended diet trial requires strict adherence to the diet and the eating of enough prescribed foods to maintain weight and nutrition. With the detailed menus and recipes published with these diets this maintenance is readily accomplished. The fact that food allergy often is decreased in the summer explains the absence or decrease of attacks and symptoms from June to September. As food allergy becomes active again from August to January, the attacks recur, attributed, as already noted, too often to infectious colds rather than to the activated food allergy. Finally, regularly recurrent so-called head colds, with or without cough or asthma, that keep children out of school, must suggest food allergy as the frequent cause.

DR. FRED W. WITTICH, Minneapolis: Protection methods in the therapy of allergic states of the lower respiratory tract based on such an approach as Dr. Feingold's are rational. It is now generally recognized that paroxysms of asthma are not characteristic of all bronchial allergies. Allergic bronchitis has been described for some time in the literature on allergy as a "hypersensitive state which is frequently complicated by secondary infection." Unfortunately, the causative factors and the mechanism involved are frequently unrecognized by the physician who fails to apply proper allergy procedures in his practice. Avoidance or elimination measures, when practical, are paramount. If these are not possible, immunization offers the best protection. Meantime, adjunct symptomatic therapy assumes primary importance. Obstruction in many of these cases is not due so much to bronchospasm as it is to the result of edema of the mucous and increased mucous secretion. Segal has shown that greater protection from antiallergic agents is obtained when they are given in aerosol form rather than by the less direct intravenous route. Older children get relief when these aerosols with the hand nebulizer are used. For children, a combination of equal parts of a solution of 1:100 isopropylarterenol hydrochloride and 1:100 or 1:200 of phenylephrine (neo-synephrine®) hydrochloride, an effective bronchovasoconstrictor, in 10 per cent glycerine, which dilutes the strength of phenylephrine to less than 1:200, used by nebulization, is preferred. Orally, ephedrine and phenylpropanolamine are the drugs of choice, as Dr. Feingold has indicated. It is rational to expect the most rapid and sustained antiallergic effect by having these drugs reach the receptor cells in the bronchial mucosa by direct nebulization, supplemented by the xanthine compounds, theophylline or aminophylline, alone, orally, intravenously, or by rectal suppository, and preferably in combination with a barbiturate. Caution should be used by commencing with lower than average therapeutic doses and increasing or changing by clinical trial until the optimum beneficial effect, without side reactions, is determined. Besides being accomplishable by hydration and iodides, the removal of mucus may be greatly facilitated by the simple use of steam inhalations. When infection complicates the picture the procedures prescribed by Dr. Feingold are most satisfactory. Here, again, in the older children, an aerosol composed of a solution of crystalline penicillin G, 35,000 units in 0.50 cc. of distilled water, with 0.20 cc. of epinephrine or phenylephrine, with or without the addition of 0.10 cc. of glycerite of hydrogen peroxide in 10 per cent glycerine, has been found very effective. It may be used daily for five to seven days. I have also seen startling relief from a persistent cough in a few of these cases by the use of mild roentgen therapy in the hands of an expert.

DR. BEN F. FEINGOLD, Los Angeles: I should like to reemphasize the fact that allergic bronchial disease is a definite entity, provoked by the common allergens food, environmental factors and pollens, which produce definite tissue changes that are limited to the bronchial tree. In the aggravated form these tissue changes manifest themselves as bronchial asthma. When the parenchyma is involved in these cases, it is secondary to involvement of the bronchial tree; the result of inspissation of mucus and dehydration, which produces plugging, atelectasis and superimposed pneumonitis—the picture so frequently referred to as allergic bronchopneumonia. The therapist should keep in mind the medication that will relieve those factors that produce obstruction. Edema is a most important factor, along with bronchospasm and mucus plugging. The medication that will relieve these three factors should be the drug of choice. To date, our armamentarium is extremely limited. For the acute attack epinephrine is the drug of choice. To liquefy the plugs and relieve obstruction, hydration is imperative. Potassium iodide is the expectorant drug of choice. When infection is superimposed specific therapy should be directed against the infection. In bronchial allergy infection is a secondary factor. When infection in the form of bacteria or of bacterial products produces primary tissue hypersensitivity it does not affect the bronchial tree to produce the tissue reactions that explain the signs and symptoms of bronchial allergic disease or bronchial asthma. Parenchymal involvement in bronchial allergy is secondary to obstructive factors. Dr. Rowe has mentioned the fact that food may produce fever and has raised the question of the importance of infection in children with these diseases. General practitioners and pediatricians have seen many of these children with upper respiratory tract infections precipitating bronchial symptoms, who respond to the ordinary garden variety of therapy, that is, to the antibiotics and the sulfonamides. With such a good response to antibiotics, it is hard to believe that food is the precipitating agent. The failure to mention the psychosomatic factors is perhaps a reflection of our attitude toward their importance as causative agents in bronchial allergy and asthma in children. Like infection, psychosomatic conditions are contributory rather than primary. One so frequently observes children with a history of recurrent attacks of asthma or recurring attacks of bronchial allergy who will show complete adjustment in their behavior problems when their allergy is under control.

Rehabilitation of the Handicapped.—With close to 50 million people working under our compensation laws, with the cost of disability benefits insurance largely paid for by the workers themselves, with the cost of old age benefits paid for by taxation or our social security plan, it should be evident to everyone that it is the worker and not the employer who pays the cost of every kind of social insurance. It follows that when you . . . make it possible for a handicapped person to earn his living, you will have won a double victory. First, you will have restored the economic independence of a fellow human being. Second, you will have relieved a fellow worker of the burden of his support.—Ashley St. Clair, *Industrial Medicine and Surgery*, March 1951.

TRANSORBITAL LEUCOTOMY IN A STATE HOSPITAL PROGRAM

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State hospitals throughout the United States are faced with the problem of an expanding general population with an increasing number of mentally ill, great numbers of whom are denied proper and adequate state hospital care because of the relatively static and insufficient number of available beds. It has been estimated that there are today 8,470,000 psychiatric cases in the United States, of which 938,000 are cases of psychoses and 434,000 of psychoneuroses.[1] Of the total 680,913 neuropsychiatric beds in the United States, comprising 47.9 per cent of all hospital beds, 562,678 are in state hospitals.[2] An estimated 311,000 additional beds [3] are required to meet the state hospital needs, and the state hospital overcrowding, nationally, averages 16.3 per cent.[4] This, in addition to the human, social and economic aspects, is a vital and urgent physical problem requiring attention. With approximately 210,000 new patients [5] being admitted annually to mental hospitals and with the increasing number of the aged and chronically ill populations of state hospitals, it can readily be seen that not only must more hospitals and beds be made available, but steps must be taken in the way of added therapeutic measures which can be used for the patients with chronic mental illnesses so as to restore them to society and relieve the mounting burden of nursing care within state hospitals.

A very sizable proportion of patients in state hospitals have already received the various present day accepted forms of therapy, and they either have made only temporary recoveries with frequent relapses or have failed to respond. A fair number of these patients might respond favorably to some form of psychosurgery. Since the development of prefrontal lobotomy by Egas Moniz,[6] its introduction to this country by Freeman and Watts [7] and its utilization in psychiatric clinics throughout the civilized world, other forms of psychosurgical procedures have been elaborated and are being used successfully in the treatment of certain mental disorders which heretofore had failed to respond to the less drastic methods of treatment.

There are a number of very practical considerations which the psychosurgical procedures of prefrontal lobotomy,[8] topectomy,[9] cortical undercutting,[10] thalamotomy [11] and lobectomy [12] fail of solution. All these methods require the services of a trained neurosurgeon (not enough of whom are to be had for all state hospitals); they entail moderate or extensive surgical attack; they are time consuming, and in the case of thalamotomy elaborate preparation is necessary; some necessitate the collaboration of a neurophysiologist and roentgenologist; the duration of hospitalization may be longer than that for the average craniotomy, especially in the case of prefrontal lobotomy; nursing care often is extensive; expense is relatively high, and postoperative epilepsy is a not infrequent sequela of those methods producing considerable cortical injury. Another factor, which has caused many general practitioners and psychiatrists to refuse to recommend psychosurgery for patients having even a disabling psychosis or psychoneurosis, has been the untoward personality changes frequently observed after the orthodox type of prefrontal lobotomy.[13]

It appears likely that the deficiencies of the above methods can be overcome, and the needs of a state hospital program met, by the technique known as transorbital leucotomy (or lobotomy), which was developed by Fiamberti [14] in 1937 and introduced to this country by Freeman [15] in 1946. Transorbital leucotomy has been used by a number of workers,[16] with varying results, this variability probably being due to differing techniques. Encouraging reports by Freeman,[15b] Jones and Shanklin,[16d] Haas and Williams,[16e] Rusk [17] and Moore and Winkelman [18] have brought to the fore the advantages of transorbital leucotomy. These are as follows: The operation can be performed by a competently trained psychiatrist or neurologist on the staff of the psychiatric institution utilizing this procedure; from 12 to 15 patients can be operated on by this method in the time required for one patient by most of the operative techniques previously mentioned; the patients are ambulatory within a matter of hours after operation and require little or no nursing attention after the immediate postoperative period; expense to the patient and hospital is minimal as compared with the other psychosurgical methods; postoperative epilepsy is of extremely low frequency or is absent, in view of the fact that only a small area of cortex

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Read before the Section on Nervous and Mental Disease at the Ninety-Ninth Annual Session of the American Medical Association, San Francisco, June 28, 1950.

From the University of Pennsylvania Graduate School of Medicine (Dr. Moore) and Wernersville State Hospital (Dr. Hill, Superintendent, and Dr. Lutz).

Mr. Frank S. Dimon, M.S.W., assisted in the statistical work, and Mrs. Marie Duell, R.N., and her staff assisted in the operating room and with the nursing care.

1. Lemkau, P.; Tietze, C., and Cooper, M.: A Survey of Statistical Studies on the Prevalence and Incidence of Mental Disorder in Sample Populations, Pub. Health Rep. **58**: 1909, 1943.
2. Arestad, F. H.; Leveroos, E. H.; Albus, W. R., and Corbett, W. W.: Hospital Service in the United States, J. A. M. A. **137**: 1385 (Aug 14) 1948.
3. Hoge, V. M.: Progress Report on Hospital Survey and Construction Act, read at conference on the American Public Health Association, Boston, Nov. 12, 1948.
4. Mental Hygiene Statistics, MHS-1, Federal Security Agency, United States Public Health Service, Mental Hygiene Division, Nov. 1, 1948.
5. Unconquered Frontiers, Psychiatric Foundation, Group Advancement Psychiatry, Report A7, March 1, 1947.
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7. Freeman, W., and Watts, J. W.: Prefrontal Lobotomy in Agitated Depression: Report of Case, M. Ann. District of Columbia **5**: 326, 1936; Prefrontal Lobotomy in the Treatment of Mental Disorders, South. M. J. **30**: 23, 1937.
8. Egas Moniz.[6] Freeman and Watts.[7]
9. Heath, R. G., and Pool, J. L.: Bilateral Fractional Resection of Frontal Cortex for the Treatment of Psychoses, J. Nerv. & Ment. Dis. **107**: 411, 1948. Pool, J. L.: Topectomy: The Treatment of Mental Illness by Prefrontal Gyrectomy or Bilateral Subtotal Ablation of Frontal Cortex, Lancet **2**: 776, 1949.
10. Scoville, W. B.: Selective Cortical Undercutting as a Means of Modifying and Studying Frontal Lobe Function in Man: Preliminary Report of 43 Operative Cases, J. Neurosurg. **6**:65, 1949.
11. Spiegel, E. A.; Wycis, H. I.; Marks, M., and Lee, A. J.: Stereotaxic Apparatus for Operations on the Human Brain, Science **106**: 349, 1947.
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is injured, and this in a relatively nonepileptogenic zone, and the operation does not produce undesirable personality traits or intellectual deficits or worsen existing ones.[19]

CLINICAL MATERIAL AND METHOD

One hundred and two patients,[20] 60 women and 42 men, have been operated on since June 16, 1949. The last group of patients were operated on March 23, 1950; thus, these patients have been observed from approximately two to 10 months. The age range of the patients was from 18 to 54 years. The duration of illness varied from two to 24 years (fig. 1), and the distribution of patients in terms of length of illness can be seen in the chart. There was no case of repeated transorbital leucotomy. The patients in this series had previously received numerous forms of therapy, more than one-half having been treated in private mental hospitals, where they had been given psychotherapy, pentylenetetrazole (metrazol®) shock, insulin shock and electric convulsion treatment. Two patients had had prefrontal lobotomies, without benefit. The patients who had been treated in the Wernersville State Hospital had also received the above-mentioned forms of treatment and had failed to respond satisfactorily. Patients admitted during the two years prior to this report have had intensive psychotherapy before other measures were employed. The great majority of our patients have been ill for considerable periods and constitute the group who have been

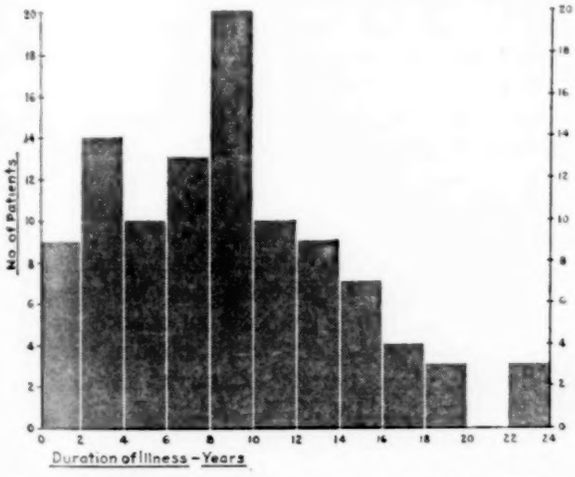

Fig. 1.—Distribution of patients with various psychiatric disorders according to duration of illness.

resistive to available therapeutic measures and have represented serious problems in nursing care. A large part of them have been drawn from the "back" wards and have heretofore been considered as permanently nonsalvageable, custodial cases.

It will be seen from table 1 that the 97 cases of schizophrenia represent almost the total number of cases, and this reflects the main burden of the therapeutic problems in most state hospitals. There were two cases each of involutional melancholia and mental deficiency with psychosis, and one case of psychopathic personality. The two patients with involutional melancholia had failed to respond to repeated courses of shock therapy. The two mentally defective patients with paranoid psychosis had aggressive, assaultive behavior, evolving from a paranoid trend. The patient with a psychopathic personality had previously manifested persistent disturbing, aggressive, antisocial behavior and required constant supervision during the nine years preceding operation. Among the 97 cases of schizophrenia, there were 39 of the hebephrenic, 34 of the catatonic, 13 of the paranoid and 11 of the mixed hebephrenic and catatonic type (table 2).

Psychological studies could not be done on all 102 patients before and after operation, for physical reasons; therefore a representative random sample of 14 patients were studied before and after operation, with the following battery: Wechsler-Bellevue Intelligence Scale—Form I; Shipley Institute of Living Scale; House-Three-Person Drawings; Machover Body Form; Bender Gestalt test; Szondi test, and Rorschach test.[21]

The operative technique used with the first 43 patients was that originally described by Freeman,[15c] in which bilateral sections were made at 4 or 4.5 cm. and at 7 cm. from the margin of the upper eyelid, thus severing thalamocortical fibers to areas 11 and 12 and 9 and 10 of Brodmann. For the remaining 59 patients, who represented the more seriously ill, the modification of Moore [22] was used, in which sections were made at 4.5 and 7 cm. plus a lateral sweep, which presumably severed fibers to area 46. The preparation for operation was the one already described in a previous communication.[22] Briefly, it consists of the careful selection of patients, with exclusion of those with suspected organic cerebral disease, and the prophylactic use of penicillin in oil (300,000 units), given intramuscularly, and sulfadiazine and sulfamerazine, administered orally the day before, the day of and the day following transorbital leucotomy. Menadione, ascorbic acid, and rutin were also given for the same period. The time required to perform transorbital leucotomy is only a few minutes, and, although intravenous injections of thiopental (pentothal®) sodium has been used by some for anesthesia, we have employed electric shock coma, as advocated by Freeman,[15c] as the most satisfactory and expeditious method. The instrument used was a transorbital leucotome (transorbitome) devised by one of us (M. T. M.)[23] (figs. 2, 3 and 4).

RESULTS

Since many of our patients presented advanced stages of their respective psychoses, comparison of moderate degrees of improvement in them with results in patients less severely ill required the establishment of three categories of improvement: recovery, good or moderate improvement, and minimal improvement. Patients who returned home and who, in the evaluation of the family, the social service worker and the physician, had established their usual prepsychotic level of social and economic adjustment were considered recovered. Patients who have been able to leave the hospital and effect a satisfactory social adjustment at home, or those who remained in hospital and have made an adequate adjustment at a subprepsychotic level were designated as showing good or moderate improvement. The patients who

13. Rylander, G.: Personality Changes After Operations on the Frontal Lobes, London, Oxford University Press, 1939. Porteus, S. D., and Kepner, R. DeM.: Mental Changes After Bilateral Prefrontal Lobotomy, Genet. Psychol. Monogr. **29**: 4, 1944. Ström-Olsen, R., and Tow, P. M.: Late Social Results of Prefrontal Leucotomy, Lancet **2**: 87, 1949.

14. Fiamberti, A. M.: Proposta di una tecnica operatoria modificata e semplificata per gli interventi alla Moniz sui lobi prefrontali in malati di mente, Rassegna di studi psichiat. **26**: 797, 1937.

15. (*a*) Freeman, W.: Transorbital Lobotomy: A Preliminary Report of 10 Cases, M. Ann. District of Columbia **17**: 257, 1948; (*b*) Transorbital Leucotomy, Lancet **2**: 371, 1948; (*c*) Transorbital Lobotomy, Am. J. Psychiat. **104**: 734, 1949.

16. (*a*) Rizzatti, E., and Borgarello, G.: La leucotomía prefrontale di Egas Moniz in 100 casi di psicopatie gravi, di cui una metà compresibili nel quadro della più completa dissociazione psichica. Schizofrenie **7**: 241, 1938. (*b*) Fernández-Morán, H.: Leucotomía e inyecciones en los lóbulos prefrontales por la vía transorbitaria, Arch. venezol. Soc. de oto-rino-laring., oftal., neurol. **7**: 109, 1946. (*c*) Haas, F. E., and Williams, D. E.: Transorbital Lobotomy: A Preliminary Report of 24 Cases, South Dakota J. Med. & Pharm. **1**: 191, 1948. (*d*) Jones, C. H., and Shanklin, J. G.: Transorbital Lobotomy: A Preliminary Report of 41 Cases, Northwest Med. **47**: 421, 1948. (*e*) Ferrero, M.: La leucotomía prefrontale transorbitaria alla Fiamberti e sue indicazioni, Note e riv. di psichiat. **71**: 1, 1942. (*f*) Walsh, J.: Transorbital Leucotomy—Some Results and Observations, Lancet **2**: 465, 1949.

17. Freeman, W.: Theoretical and Clinical Considerations of Various Leucotomy Techniques, Proc. Roy. Soc. Med. **42**: 28, 1949.

18. Moore, M. T., and Winkelman, N. W.: Some Experiences with Transorbital Leucotomy (A Review of Results in 110 Cases), read before the 106th Annual Meeting of the American Psychiatric Association, Detroit, May 3, 1950.

19. Robinson, M. G.: Discussion on Freeman, W.: Transorbital Lobotomy, Am. J. Psychiat. **105**: 740, 1949.

20. Total population of Wernersville State Hospital is 1,900 patients.

21. Henry Passaro, M. S., psychologist to the Wernersville State Hospital, made the psychological studies.

22. Moore, M. T.: La technique de la leucotomie transorbitaire, Encéphale **39**: 109, 1950.

23. Moore, M. T.: A New Instrument for Performing Transorbital Leucotomy, Am. J. Psychiat. **105**: 741, 1949. (*b*) The Moore Transorbitome, ibid. **106**:xi (July) 1949.

had made improvement in only a small area of their abnormal mental processes and in their behavior were placed in the group showing minimal improvement. Included in the last group were patients who formerly were assaultive, hostile and destructive and who became sociable and employable in hospital, and those who had been untidy, slovenly and smearing and who modified these traits and showed an interest in their personal appearance. Malamud's rating scale [24] was used in determining the degree and spheres of improvements.

Of the 102 leucotomized patients, 25 were discharged from hospital. Fifteen of these were considered to represent total recoveries, and the distribution of these patients in terms of duration of illness is seen in figure 5. The greater number of total recoveries were in patients ill less than 10 years, but it will be noted in figure 1 that the majority of patients (66) had been ill less than 10 years. It is heartening to see total recoveries in schizophrenic patients ill up to 14 years. It has been observed

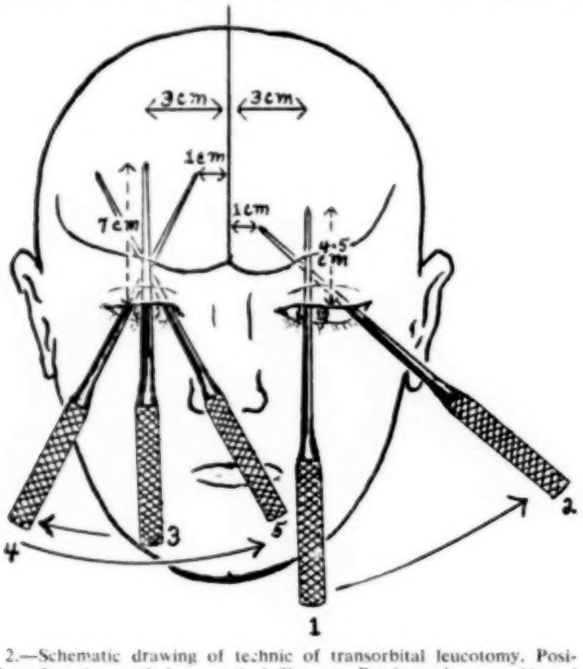

Fig. 2.—Schematic drawing of technic of transorbital leucotomy. Positions *1* to *2* undercut thalamocortical fibers to Brodmann's areas 11 and 12. Positions *3* to *4* to *5* undercut fibers to areas 9 and 10. Both maneuvers are performed on each side, plus the lateral sweep undercutting fibers to area 46, as shown in figure 4 (transorbitome pictured without extension arm).

This drawing, and figures 3 and 4, are modified illustrations based on drawings by Miss E. A. Sweezy, of Queen Mary Hospital, Montreal, Canada.

that some schizophrenic patients manifest improvement rather abruptly from two to six months after operation,[18] and this may tend to enlarge the number of discharged patients in this series.

The total number of patients with over-all improvement was 77, or 75.5 per cent (table 1). The percentage of cases of over-all improvement was fairly evenly distributed over the spectrum of duration of illness, except for the four to six year and the six to eight year groups, as is shown in figure 6. Although there is a tendency for the number of total recoveries to diminish beyond the 10 year period of duration of illness, figure 6 shows the encouraging evidence that over-all improvement is well represented in patients ill more than 10 years. The small number of patients who comprised the groups other than the schizophrenic, as seen in table 1, does not offer a statistically valid basis, in this series, from which to draw conclusions regarding the relative value of transorbital leucotomy in these disorders. This aspect will be considered later in the discussion. Both patients with involutional melancholia have maintained full recovery since operation. One mentally deficient patient with a paranoid psychosis was relieved of his assaultiveness, surliness and hallucinatory paranoid trend. The patient with the psychopathic personality, previously mentioned under "Material and Method," after transorbital leucotomy became stable and polite, observed the social amenities and has been continuously employed as the hospital librarian.

TABLE 1.—*Distribution of Psychiatric Disorders in One Hundred and Two State Hospital Patients*

Diagnosis	No. Cases	Improvement	
		No. Cases	Per Cent
Schizophrenia	97	73	75
Involutional melancholia	2	2	100
Mental deficiency with psychosis	2	1	50
Psychopathic personality	1	1	100
Total	102	77	75.5

Of the types of schizophrenia, the catatonic form responded most favorably to transorbital leucotomy, with a total recovery rate of 29.4 per cent and an over-all improvement rate of 88.2 per cent (table 2). The patients in this group formerly had persistently relapsed when shock therapy was discontinued, or had relapsed during treatment. In the paranoid category there was a total recovery rate of 7.7 per cent and an over-all improvement rate of 84.6 per cent. The paranoid schizophrenic patient who made a complete recovery was freed of his paranoid delusional ideational trend.

There were no total recoveries in the hebephrenic or the mixed groups; however, the 28.2 per cent "good" improvement rate for the hebephrenic group, and the 9 per cent "good" improvement rate for the mixed group have been gratifying, as these patients are now employed in the hospital, are able to adjust to life in convalescent and open wards and in some cases have returned home,

TABLE 2.—*Relation of Improvement to Type of Schizophrenia*

Schizophrenia	No. Cases	Improvement						Total % Improvement
		Minimal		Good		Recovery		
		No.	%	No.	%	No.	%	
Hebephrenic	39	13	33.3	11	28.2	0	0	61.5
Catatonic	34	12	35.3	8	23.5	10	29.4	88.2
Paranoid	13	6	46.1	4	30.8	1	7.7	84.6
Mixed hebephrenic and catatonic features	11	7	63.6	1	9.0	0	0	72.6
Total	97	38	39.2	24	24.7	11	11.3	75.2

making satisfactory social adaptations. The "minimal" improvement rates for patients with hebephrenic and mixed types lift the over-all improvement rates, respectively, to 61.5 and 72.6 per cent. The distribution of patients who recovered or showed improvement among the schizophrenic patients is shown in figure 7.

The minimal improvement, in all classes of schizophrenic patients, constitutes a major advantage in a state

24. Malamud, W., and Sands, S. L.: A Revision of the Psychiatric Rating Scale. Am. J. Psychiat. **104**: 231, 1947.

hospital, in that such patients, who had been serious nursing problems, have shown improvement in their attitude and behavior, are approachable by ward personnel, have discontinued their assaultive, surly, aggressive tendencies, have ceased or lessened their destructiveness and have become amenable to hospital protocol. Illustrative of "minimal" improvement are a schizophrenic patient whose eating habits were those of an animal and who now uses utensils without close supervision, another who had required restraint for five years and at present is an ideal open-ward worker, and, finally, a patient who had been extremely untidy and destructive and who now sits unattended in the ward and diligently works on a jigsaw puzzle.

The time of appearance of improvement after transorbital leucotomy varied considerably in our series. It appeared with dramatic suddenness, within a day or two, in the cases of involutional melancholia, and several of the patients with catatonic schizophrenia also showed startling improvement immediately after operation. In general, however, in patients who have maintained their gain, the improvement developed over a period of several

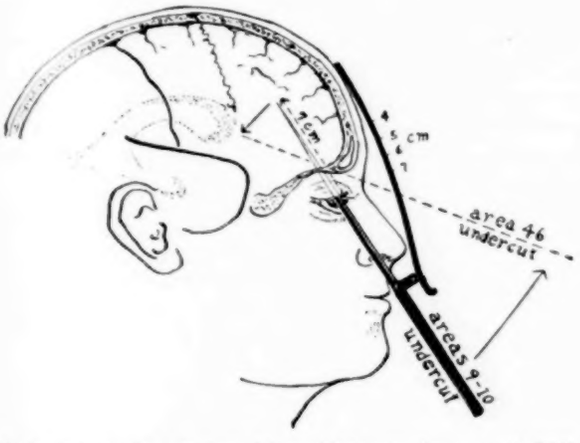

Fig. 3.—Lateral view of transorbitome (with extension arm attached) at the 7 cm. mark (distance from tip of instrument to the rim of the upper eyelid). Note the perforation of the orbital plate behind the frontal sinus.

weeks after operation. Many among the improved group manifested the salutary change after the fourth to the sixth postoperative month. Two schizophrenic women patients who had been chronically disturbed for more than five years had dramatic immediate relief of symptoms but relapsed a month after operation. These patients have now responded more favorably to electric convulsive therapy than prior to transorbital leucotomy.

In the main, patients who showed intense agitation, anxiety, disturbances in the affective sphere or symptoms of autonomic derangement responded best to transorbital leucotomy. This was also true of those who previously had done well with shock therapy but who failed to maintain recovery.

Of the two patients who had had orthodox prefrontal lobotomies, one responded favorably after transorbital leucotomy and now is employed in the hospital, lives in an open ward and is improved in her social attitudes, despite the persistence of her psychotic ideation. The other patient improved temporarily, then relapsed and at present is maintained at a moderately improved status by means of electric convulsive therapy.

Among the 11 totally recovered schizophrenic patients, four had a history of excessive use of alcohol. After transorbital leucotomy they did not have a decreased tolerance to alcohol when used, but they were able to abstain from bouts of heavy drinking. These pa-

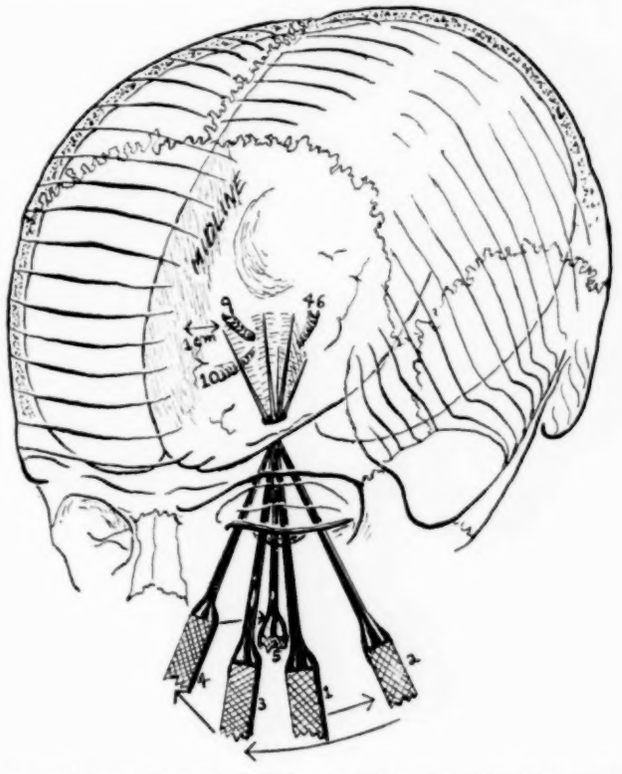

Fig. 4.—Phantom drawing illustrating the relative positions of the transorbitome during sectioning of fibers to areas 9 and 10 and to area 46. The instrument at the 7 cm. mark is moved from positions 1 to 5, as shown.

tients had indulged in alcohol to allay a dominant element of anxiety, and subsequent to transorbital leucotomy anxiety was significantly lessened or abolished.

None of the patients given the battery of psychological tests showed any evidence of adverse personality or intellectual changes after transorbital leucotomy, nor did those not studied by psychological tests show clinical manifestations of overt emotional or intellectual deficits. Among the improved patients, the significant changes disclosed by the psychological tests were decreased anx-

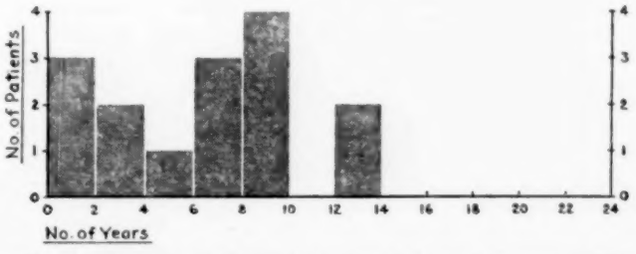

Fig. 5.—Distribution of 15 patients who had complete recovery after leucotomy according to duration of illness.

iety, better control of explosive affective responses, less rigidity of personality, better organization of thinking and improved judgment. Abstract thinking was not affected in either direction. General performance was greatly improved in those patients in whom anxiety was a dominant feature prior to operation.

COMPLICATIONS (TABLE 3)

Two patients had postoperative hemorrhage, exhibiting frankly bloody cerebrospinal fluid, without localizing neurological signs. One died the day of operation, and the other after 24 hours; permission for necropsy was not granted. The mortality rate was 1.96 per cent, as

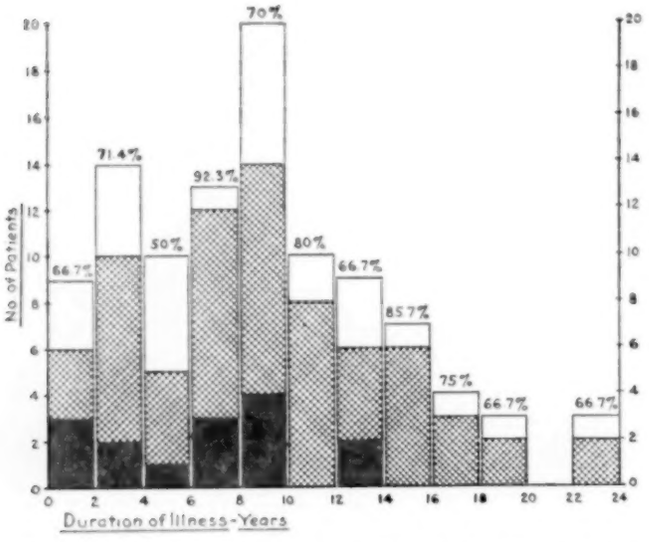

Fig. 6.—Relation of improvement or recovery after leucotomy to duration of illness of patients with various psychiatric disorders.

compared with a 3 per cent mortality rate in 1,000 cases of prefrontal lobotomy reported by the Board of Control, England and Wales [25]; 6 per cent in 48 cases of prefrontal lobectomy reported by Peyton, Noran and Miller [12]; 3.2

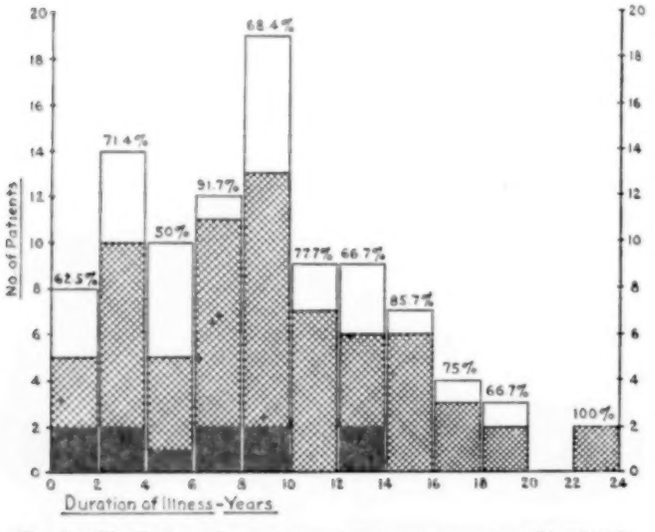

Fig. 7.—Distribution of recovery or improvement among schizophrenic patients after leucotomy.

per cent in 44 cases of thalamotomy reported by Spiegel and Wycis [26]; 4.6 per cent in 43 cases of selective cortical undercutting reported by Scoville,[10] and 3.7 per cent of 107 cases of frontal lobotomy (Lyerly technique) reported by Oltman and associates,[27] our mortality rate is favorable.

Urinary incontinence occurred in 11 patients and terminated spontaneously in 10 patients within 24 hours. It persisted 30 days in one patient. Drowsiness appeared in five patients, in sharp contrast to the usual alertness of the patients within 20 to 30 minutes after operation. The drowsiness disappeared within 24 hours in four patients and endured seven days in one patient, who had associated fever.

One patient had a periocular hematoma, due to rupture of a conjunctival vein at the point of entry of the transorbitome. This subsided within 72 hours and finally was completely resolved in five days.

There were no postoperative infections, and in none of the patients did epilepsy develop.

COMMENT

By far the greater load of responsibility in most state hospitals consists of the care of chronically ill patients who already have been treated by one or more of the numerous methods now employed for the treatment of the mentally ill. Psychotherapy; psychoanalysis; narcosynthesis, and metrazol,[3] insulin and electric convulsion therapy, although remarkably effective, leave a residue of unresponsive or frequently relapsing patients, who eventually constitute a large proportion of the state hospital population. This is especially true of the schizophrenias, the obsessive-compulsive psychoneurosis and some of the affective disorders. When the psychosis has endured for years, the patient often becomes inaccessible, disturbed, assaultive; he requires restraint, and with the passage of time he is rejected with increasing indifference by his acquaintances, friends and the members of his family. These patients ultimately become desocialized persons.

TABLE 3.—*Complications Following Transorbital Leucotomy*

Complications	No. Cases	Comment
Hemorrhage	2	2 deaths—mortality 1.96%
Incontinence of bladder	11	Endured 1 day, 10; endured 30 days, 1
Drowsiness	5	Endured 1 day, 4; endured 7 days, 1
Fever	2	Endured 7 days, 2
Periocular hematoma	1	Subsided in 3 days, resolved in 5 days

It was to the problem of these "lost" patients that we applied the procedure of transorbital leucotomy, which we have found to be simple, rapid in performance, relatively safe, requiring a minimum of equipment and nursing personnel and one which did not produce postoperative personality or intellectual deficits. The other forms of psychosurgery were beyond the reach of our state hospital because of the specialized and costly requirements. The demands on the nursing staff in a procedure such as prefrontal lobotomy would preclude its use with large numbers of patients. Of six patients, resident at Wernersville State Hospital, who had prefrontal lobotomies, two required continuous intensive nursing care for six months. There were definite untoward personality changes in these patients, and retraining was necessary, placing a heavy drain on the nursing resources.

25. Board of Control (England and Wales), Results in 1,000 Leucotomies, London, His Majesty's Stat. Off. 1947.

26. Spiegel, E. A., and Wycis, H. T.: Thalamotomy (Theoretical Considerations, Practical Results and Neurosurgical Aspects), Digest Neurol. & Psychiat. **18**: 150, 1950.

27. Oltman, J. E.; Brody, B. S.; Friedman, S., and Green, W. F.: Frontal Lobotomy, Am. J. Psychiat. **105**: 742, 1949.

Transorbital leucotomy in our hands proved to be ideally suited to a state hospital. On operative days as many as 15 patients were operated on within a span of 1½ hours. Other psychosurgical methods require as much time or more for one patient. Patients were ambulatory within 24 to 48 hours and required no nursing care after the immediate postoperative period. Of the patients who failed to improve after transorbital leucotomy, none was made worse clinically.

The morbidity in this series of patients was extremely low, and the nature of the complications, aside from hemorrhage, was insignificant. Our mortality rate compared with that for other psychosurgical methods has already been discussed and is distinctly favorable, and increased experience should lower the figure of 1.96 per cent to a negligible one. The absence of postoperative convulsive seizures in this series, and the extreme infrequency of the occurrence of epilepsy in the series reported by Freeman [28] and Moore and Winkelman [18] is in sharp contrast with the occurrence of postoperative epilepsy with the other psychosurgical methods—prefrontal lobotomy, 7 to 20 per cent,[29] cortical undercutting, 9.3 per cent [10]; topectomy, 16 per cent,[30] and lobectomy, 28 per cent.[12]

It is not to be inferred from the large proportion of schizophrenic patients comprising our series that other types of psychoses and psychoneuroses are not suitable for transorbital leucotomy. Freeman,[28] Jones and Shanklin,[16d] and Moore and Winkelman [18] have reported gratifying results in cases of the obsessive-compulsive psychoneuroses, anxiety states and affective psychoses. The series of Moore and Winkelman [18] and a large part of Freeman's [28] consisted of patients derived from private practice, and hence the element of selection was a determining factor in the statistical results. The human and socioeconomic problems encountered in state hospitals should not be subject to statistical considerations. If it is possible to salvage but a few patients, without producing psychic and behavioral changes worse than had existed, a real advance will have been made.

As the result of our experience, we feel justified in recommending that patients admitted to state hospitals should be offered the advantages of transorbital leucotomy when other forms of therapy have repeatedly failed of their purpose. Protracted conservatism in the treatment of the patient with an admittedly chronic mental disorder merely permits of the development of more deeply grooved patterns of neuronal and behavioral abnormalities. Although we believe that the type of patients under discussion should have the operation within one to three years after other measures have failed or show no promise of success, the results of our studies indicate that some patients ill as long as 10 to 24 years may effect either recovery or satisfactory improvement.

Transorbital leucotomy and other psychosurgical procedures undoubtedly have proved a boon in many cases of intractable mental disorders, but it must not be concluded, nor do we wish to create the impression, that psychosurgery represents the ultimate answer to the difficult questions now confronting the psychiatrist. Psychosurgery is merely a useful tool, which, in the light of our meagre knowledge, yields satisfying results today, but which in future may be considered a crude transition to the biochemical cerebral scalpel to come.

SUMMARY AND CONCLUSIONS

A group of 102 state hospital patients in whom bilateral transorbital leucotomy was performed is reported.

1. The series was composed of 97 patients with schizophrenia, 2 patients with involutional psychosis, 2 patients with mental deficiency with psychosis and 1 patient with psychopathic personality.

2. The patients comprising the schizophrenic and involutional groups had previously received the various forms of accepted treatment, without benefit.

3. Among the 97 schizophrenic patients, those with the catatonic type had an over-all improvement rate of 88.2 per cent and a recovery rate of 29.4 per cent; those with the paranoid type, an improvement rate of 84.6 per cent and a recovery rate of 7.7 per cent, and those with mixed and hebephrenic types, over-all improvement rates of 72.6 and 61.5 per cent, but no recoveries.

4. Both patients with involutional psychosis recovered.

5. One mentally deficient patient with psychosis recovered from the psychotic phase.

6. The one patient with psychopathic personality recovered.

The morbidity and mortality are discussed and compared with those for the other forms of psychosurgery employed today. The advantages of transorbital leucotomy for a state hospital program, over the more elaborate psychosurgical procedures, are based on the ease and rapidity of performance, the relative safety, the low cost, the low drain on nursing facilities, the negligible morbidity and low mortality and the comparable or superior results.

Transorbital leucotomy is recommended as a useful adjunct to the various therapies employed in state hospitals, for patients who are amenable to this procedure and who heretofore have been relegated to the status of prolonged custodial care.

ABSTRACT OF DISCUSSION

DR. MARGARET A. KENNARD, Portland, Ore.: This excellent presentation suggests many topics for discussion. The point that the transorbital leucotomy assists in the practical considerations of a state hospital in relation to the patients in the "back wards," is important. The ease of operation and the lessening of the nursing care are of practical importance. There is less personality disorder and less epilepsy after this operation, and the method has been effective in some instances in which other methods have failed. It has worked particularly well in cases of affective disorders. This report leaves many points for future discussion. The relation to the autonomic system is interesting. From investigations on animals, largely primates, it is known that the orbital surface of the frontal pole is related to the autonomic system, for lesions in this region will produce changes in respiratory rate, pulse rate, and blood pressure and will influence gastrointestinal motility. It is known, from experiments carried out by Drs. Robert and Kenneth Livingston at the Boston Psychopathic Hospital, that electrodes placed on the orbital surface of the human brain will produce changes in blood pressure and pulse rate; so there is plenty of evidence of cortical autonomic localization, is at least in part, on the orbital surface of the frontal pole. Incidentally, if, as Dr. Moore says, he is interrupting the fibers from areas 9 and 10, he is interrupting

28. Freeman, W.: Psychosurgery, read before the 106th Annual Meeting of the American Psychiatric Association, Detroit, May 1-5, 1950.

29. Freeman, W.: Psychosurgery, Am. J. Psychiat. **105**: 581, 1949.

30. Columbia-Greystone Associates, Selective Partial Ablation of the Frontal Cortex—A Correlative Study of Its Effects on Human Psychotic Subjects, edited by F. A. Mettler, New York, Paul B. Hoeber, Inc., 1949.

fibers which lead to tracts on the lateral surface also, and regions which, so far as we know, have to do with motor performance and therefore might relate to postoperative epilepsy. Other investigators are operating on the cingular gyrus and reporting similar kinds of changes, notably in affect and in the amount of aggression of the patients. The reports of similar changes in these two areas are reasonable, for both the cingular gyrus and part of the orbital surface of the frontal pole are developmentally of the same nature; they are the oldest parts of the frontal pole. They connect specifically with the temporal lobe and, through the temporal lobe, in part at least, with the hypothalamus. It is reasonable to suppose, therefore, that these areas should have something to do with the emotional and autonomic performance of the individual organism. It is still possible, however, from our present knowledge, that such changes have nothing to do with the specific cortical area, but that frontal ablations have merely a quantitative effect. One could then take away a certain amount of tissue from any part of the lobe and produce the same kind of results. The long term results of any frontal lobotomy are not well known at present. I question whether there is less epilepsy after the transorbital leukotomy, for data from war injuries show that many persons do not have onset of epilepsy until months after the original insult. This paper is an excellent clinical report and one of the best I have seen on the frontal pole in relation to human behavior. But it is not well controlled, and you as clinicians would criticize me as an investigator if I published anything which had as little preoperative and postoperative follow-up. This is consistently true of all reports published at the present time. One finds on reviewing the literature on the frontal poles, that we rely a great deal on data which are coming from England and from Sweden and the other Scandinavian countries. This is, in part, due to the fact that for many years in those countries they have had a central board of information and control in relation to the frontal lobotomies. Enormous numbers of transorbital lobotomies are being done in this country about which we know nothing, because they are being done, quite correctly, by private physicians, who see only one, two or three in the space of a short time. If we had had a central board or an organization for information in relation to frontal lobotomies in the past 10 years, we should know a great deal more than we do at present. I wonder if, under the auspices of some organization, such as the American Medical Association, it would not be well to organize something of this kind, not for the control of lobotomies, but for the dissemination of information, so that, in the next 10 years, we might be able to have a more reasonable working knowledge of the lobotomy and be able to work on the patient, not in the back ward, but before he gets to the hospital.

Dr. Walter Freeman, Washington, D. C.: Most hospitals are ill equipped for major neurological surgery, and few of them have neurosurgeons on the attending staff or the rather elaborate setup for surgical convalescent care. Therefore, transorbital lobotomy seems likely to find its place in the therapeutic armamentarium of the state hospital. Four factors are of importance in psychosurgery. Of these, safety and effectiveness seem to have been largely controlled. Accuracy has been sought by neurosurgeons interested in topectomy, although they have stated that the quantity of frontal cortex removed is more important than the exact location. Finally, availability of psychosurgery must be considered. The problem of hospitalization is growing, admissions to psychiatric hospitals running over 300,000 in 1949. Transorbital lobotomy, as Dr. Moore has stated, brings psychosurgery to the place where it is most needed. There is growing realization that the personality change observed after lobotomy usually resembles that of a "burnt-out" psychosis. Only seldom is the syndrome of frontal lobe deficit encountered, and this occurrence means that the lobotomy has been needlessly extensive. Furthermore, shock therapy, while it may control excited and vicious behavior, tends to mask the process of deterioration, so that when lobotomy is finally considered the opportunity for constructive reintegration of the personality is likely to be past. Then it is the aim of the surgeon to arrest the psychotic process by a radical or maximal operation. Dr. Moore has shown that transorbital lobotomy of itself leaves no distressing residuals and has few complications. Therefore, it may be applied early in the course of a mental disorder, with good chances of returning a normal individual to society.

Dr. Karl Von Hagen, Los Angeles: Dr. Moore and his associates have presented evidence that a relatively simple neurosurgical procedure may be of great benefit to a certain number of patients. It is this simplicity of procedure which troubles me, because it will be available to many physicians, some of whom may not apply the rigid requirements for the operation and therefore may operate needlessly and inadvisedly. This could bring psychosurgery into disrepute, thus interfering with the scientific progress of psychosurgery, which should provide additional knowledge of the function of the frontal lobes. I have had little personal experience with this procedure, largely because of my type of practice, and partly because of some reluctance to recommend such an operation. It is difficult, on the basis of my concept of cerebral function, to accept the statement that no adverse psychological functions can be demonstrated. These patients are psychotic, and adverse emotional factors are difficult to demonstrate in such patients. It is likely that if this procedure is applied to psychoneurotic patients, which is inevitable, emotional defects will be manifest. I believe that the frontal lobes serve to utilize the concepts that are stored posteriorly for the best adjustment of the individual in his environment and any destructive procedure, such as transorbital leucotomy or the other lobotomies, should leave some defect, which, in the cases I have seen, is largely in the field of affect—emotional flattening, lack of consideration for the feelings of others, lack of ambition and some defect in introspection. I feel that this procedure, properly used, should be of great benefit to the chronic psychotic patient in the state hospital, but if its use is allowed to spread indiscriminately to other types of patients it will probably be detrimental to the advance of psychosurgery.

Dr. Matthew T. Moore, Philadelphia: We have by no means solved all the problems of psychosurgery. It may be that some day we shall look back on this age as a barbaric one in many respects, not alone in psychosurgery. Dr. Kennard has noted some important phases in the approach to psychosurgical procedures. As the result of the significant neurophysiological contributions of Fulton and others, prefrontal lobotomy and other psychosurgical procedures have been made possible. Dr. Kennard commented on the autonomic functions of the frontal lobe and the possible aberrations resulting from psychosurgery. Undercutting of the cingular gyrus, as advocated by Scoville, has produced autonomic disturbances, such as tachycardia, drowsiness and incontinence. In our series, we had 11 cases of urinary incontinence, in 10 of which it endured for one day and in one for 30 days. There were five cases of drowsiness, in four of which the complication endured one day and in one for a week. In the series of 110 cases reported by Dr. Winkelman and myself, there were 11 cases of urinary incontinence, which disappeared spontaneously within two days in most instances. The assessment of the value of any psychosurgical procedure obviously cannot be complete unless the patients have been carefully observed for many years after operation. However, commissions are already in operation, and others are in the process of development, in order properly to evaluate results. Epilepsy has not appeared in our series, and in the series reported with Dr. Winkelman there was one case of postoperative convulsive seizures. In this case the seizures disappeared after a second transorbital leucotomy was performed. Dr. Von Hagen's remarks are timely, but I do not think it is necessary to introduce such a pessimistic note. Any new procedure which is introduced may be abused by some persons; however, the abuse of a procedure because of its simplicity should not condemn the procedure; rather, it reflects on those who use it. Adverse psychological factors have not been observed in our patients as the result of transorbital leucotomy, and we are in agreement with Robinson, who examined Freeman's patients, that none of the disturbing personality disturbances which are a common sequel to prefrontal lobotomy have been encountered in patients who have been operated on by the transorbital route. Our main concern is a realistic and pragmatic one. We must weigh the advantages against the disadvantages in subjecting chronically ill, and apparently nonsalvagable, patients to a procedure which may produce some adverse personality changes, but which offers so much in the way of restoring them to society and cutting down the tremendous burden of care and cost to state hospitals and other institutions.

INCIDENCE OF TRICHINELLA INFECTIONS IN SAN FRANCISCO, 1950

Rodney R. Beard, M.D., San Francisco

About 20 years ago interest in human trichinosis in the United States was stimulated by Queen's work,[1] in which he showed the incidence of infections, as measured by recovery of larvae from human diaphragms by peptic digestion, to be far higher than would be indicated by the reported diagnoses of clinical trichinosis. His study was followed by those of a succession of investigators who used similar techniques. Extensive studies of trichinous infections in men and in hogs were made, notably by Hall and Collins, and others working with Willard Wright at the National Institute of Health.[2] It was established that infections by Trichinella spiralis were quite common. Larvae were found in about 16 per cent of the human diaphragms collected in various parts of the United States. Wright, Jacobs and Walton [3] concluded that there was no correlation between Trichinella infection and sex, civil or military status, past military service, occupation, mental hospitalization, urban or rural residence, or social-economic status.

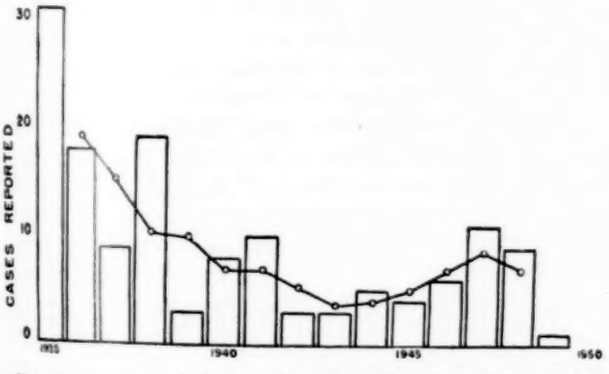

Chart illustrating the incidence of trichinosis in San Francisco, 1935 to 1949, as well as the three year moving average. (The data were supplied by the San Francisco Department of Public Health.)

One of the early investigations in this field was done in San Francisco by McNaught and Anderson,[4] who in 1936 reported on the examination of 200 human diaphragms in which they found an incidence of infection of 24 per cent.

These developments aroused considerable popular interest, and the meat-packing industry cooperated with public health agencies in a rather vigorous campaign to educate the public to cook pork thoroughly. The Federal Meat Inspection Service established regulations to insure the destruction of trichinae in pork foods intended for use without further cooking, as did some state and local authorities. The San Francisco Department of Public Health, aware that this city was a center for the production of Italian style salami, an uncooked product, stringently enforced rules providing for adequate salting and drying of this commodity or prior killing of trichinae by freezing. Since 1944 there has been but one report on necropsy studies of the incidence of this infection, a series of 50 from Mississippi showing a rate of 6 per cent.[5] Although it has not been spectacular, there has been a noticeable decline of reported cases of trichinosis in San Francisco since 1935, as shown in the accompanying figure. This has occurred despite a pronounced increase in population. Whether the decline resulted from fewer infections or from other factors is uncertain. Having become thoroughly familiar with the technique used by McNaught and Anderson and having access to necropsy material from the same sources as they, my associates and I thought it opportune to repeat the work with the purpose of comparing the current incidence with that reported in 1936.

The staff of the department of pathology of Stanford Medical School and the pathologist of the French Hospital of San Francisco were asked to take the diaphragms from all bodies on which autopsies were conducted except those of infants; a few were missed by neglect or by oversight on the part of some of those concerned, but there were no detectable systematic exclusions, and it is believed that a random sample was obtained.

METHOD

The diaphragms were ground in a household meat chopper. Pains were taken to avoid contamination of one specimen by fragments from another. Fifty gram portions of each were digested with 500 ml. of a freshly prepared solution containing 1 per cent pepsin and 0.7 per cent concentrated hydrochloric acid. The digestion was carried out in an incubator at 37 C. with constant stirring. After digestion was complete, the resultant suspension was poured through a 20-mesh brass screen into a funnel fitted with a rubber tube and pinchcock. After two hours or more the sediment in the funnel was drained off into a conical sedimentation glass; after another two hours 5 ml. or more of sediment was examined microscopically for Trichinella spiralis larvae. Sediments composed of dark, turbid material were washed by repeated settling, the supernatant being replaced with tap water. Microscopic examination was done with a binocular dissecting microscope at a magnification of 18.9 diameters by reflected light over a dark background. (It had been established that this method was as efficient as the search by transmitted light used by McNaught and Anderson and less fatiguing.) When present, the larvae were counted, successive portions of the digested mixture being taken until it was assured that continued sedimentation and sampling disclosed no more. In every positive specimen larvae were found in the first portion examined, subsequent portions showing decreasing numbers.

Department of Public Health and Preventive Medicine, Stanford University Medical School.

This work was supported in part by funds of the Rockefeller Fluid Research Fund of Stanford University Medical School.

Read before the Section on Preventive and Industrial Medicine and Public Health at the Ninety-Ninth Annual Session of the American Medical Association, San Francisco, June 30, 1950.

Assistance in obtaining specimens for this study was given by Dr. Alvin J. Cox, professor, and members of the staff of the department of pathology, Stanford University Medical School, and by Drs. George Watson and J. A. Mathewson of the French Hospital of San Francisco.

1. Queen, F. B.: The Prevalence of Human Infection with Trichinella Spiralis, J. Parasitol. **18**: 128 (Dec.) 1931.

2. Wright, W. H.; Kerr, K. B., and Jacobs, L.: Summary of the Findings of Trichinella Spiralis in a Random Sampling and Other Samplings of the Population of the United States, Pub. Health Rep. **58**: 1293 (Aug. 27) 1943.

3. Wright, W. H.; Jacobs, L., and Walton, A. C.: Epidemiological Considerations Based on the Examination for Trichinae of 5,313 Diaphragms from 189 Hospitals in 37 States and the District of Columbia, Pub. Health Rep. **59**:669 (May 26) 1944.

4. McNaught, J. B., and Anderson, E. V.: The Incidence of Trichinosis in San Francisco, J. A. M. A. **107**: 1446 (Oct. 31) 1936.

5. Brooks, T. J., Jr.; Ward, J. W., and Holder, T. M.: Studies on the Incidence of Trichiniasis in Mississippi: Preliminary Report, Am. J. Trop. Med. **28**: 863 (Nov.) 1948.

Specimens were not judged negative until all grossly visible sediment had been searched. From a technical standpoint this series is comparable to that of McNaught and Anderson without reservations.

RESULTS

Diaphragms from 161 autopsies performed between November 1949 and June 1950 were examined. Of these, 13 (8 per cent) contained trichina larvae. Encysted, shrunken larvae, appearing to be dead, were found in every positive specimen. In only three specimens were living, excysted larvae recovered. The number of larvae in each 50 Gm. of diaphragm ranged from one to 3,152; the median number was 115, and the average was 363. The age distribution of the subjects from whom the specimens were obtained and the distribution of positives by age is shown in the table. The incidence among men (9 per cent) was higher than that among women (6 per cent), but the difference is one that might readily occur by chance. There were 14 nonwhite bodies in the series, eight Negro, six Oriental; none of these showed trichinae.

Comparison of Trichinella spiralis Infections of Human Diaphragms in San Francisco in 1936 and in 1950

	1936, McNaught and Anderson				1950, Beard			
Age Group, Yrs.	Number Examined	% of Total	Number Infected	% Infected	Number Examined	% of Total	Number Infected	% Infected
1-24	10	5.0	0	..	12	7	1	..
25-39	27	13.5	4	..	20	12	1	..
40-74	139	69.5	37	..	112	70	9	..
75 +	24	12.0	7	..	17	11	2	..
	200	100.0	48	24	161	100	13	8

COMMENT

The apparent reduction by two thirds from the infection rate reported by McNaught and Anderson is quite unlikely to have been observed by chance alone. The difference (16 per cent) is four times its standard error (4 per cent).[6]

There are several possible sampling errors that might account for the observed difference. Age is one that might be most troublesome, since trichina infections are commoner with increasing years of life. As can be seen in the table, the two series are quite similar in this respect, as far as can be shown by the broad age groupings adopted in the earlier study.

Although McNaught and Anderson reported no sex difference, Wright et al.,[3] considering a much larger series, indicated infection rates of 16.7 per cent for men and 14.7 per cent for women, a difference that McNaught and Anderson considered insignificant. In the present series the rate for women is only 6 per cent, as compared with 9 per cent for men; although the numbers are too small for this difference to have statistical significance, it has to be considered a possible explanation for our lower infection rate for the sexes combined, as compared with McNaught and Anderson's observations, especially since the proportion of women in our material was 40 per cent, while it was only 30 per cent in the earlier work. However, when a statistical correction is made for the difference in sex distribution, the over-all incidence of 8 per cent is changed only in the second decimal place.

Consideration is also given to the possibility that the inclusion of a larger proportion of nonwhites in our material might be the reason for the lower infection rate. McNaught and Anderson did not mention the races of their subjects, and their original data are not available. However, we searched the autopsy protocols and succeeded in locating 37 of their 48 positive cases. We assumed that the autopsies in which there was no mention of trichinosis, performed between the dates of the first and the last of these positive cases, were representative of the negative cases in the McNaught and Anderson series. From these data we arrived at an estimate that Negroes and Orientals each represented 2 per cent of their cases. In our later series there are eight Negroes (5 per cent) and six Orientals (4 per cent). In neither series were any of the nonwhite specimens infected. When an allowance is made for the higher proportion of nonwhites in our series, the corrected infection rate is less than 9 per cent. Thus it can be safely said that the race factor did not contribute materially to the reduction in infections that appears between the two series.

An attempt was made to evaluate the possible effects of differences in the proportion of specimens coming from the several hospitals that contributed. However, we were unable to satisfy ourselves on this point. It can only be said that one of McNaught and Anderson's sources, an old peoples' home that contributed substantially to their material, was absent from our later series. Had material from this source been included in our series the percentage of positives would probably have been higher, but this difference would have been wiped out when a correction was made to put the two series on the same age distribution basis. Such a correction would have been necessary, since the two series now match each other closely.

The thesis that infections by Trichinella spiralis have been materially reduced in San Francisco is further supported by the fact that only three of our 13 positives had living larvae, while McNaught and Anderson found living larvae in every specimen. As has been pointed out by Wright, Jacobs and Walton,[3] little is known concerning the rapidity with which larvae die and begin to disintegrate or calcify. They cite reports of trichinae living in human beings for 19 to 26 years, but in none of these could the possibility of reinfection be ruled out. They also cite a report by Dammann[7] on the survival of larvae within the muscle tissue of a hog that had been infected more than 11 years previously and that was subsequently maintained in an environment that excluded reinfection. They further state that they found dead larvae in three out of four infections in persons in the age group of 5 to 9 years and mixed living and dead larvae in the fourth subject of this group, indicating that trichinae are not long-lived in all cases. We may add to this our observation of none but dead larvae in a child aged 4. The high proportion of dead larvae that we have observed suggests that some, perhaps many, of the infections that we discovered were acquired long ago, before the initiation of the trichina control measures and educational programs referred to earlier.

6. $S_{p_1 - p_2} = \sqrt{\frac{p_o q_o}{n_1} + \frac{p_o q_o}{n_2}}$ $\qquad p_o = \frac{n_1 p_1 + n_2 p_2}{n_1 + n_2}$

7. Dammann, C.: Zur Frage der Lebensdauer unter Verkapselung der Trichinen bei dem Schweine, Deutsche Ztschr. Thiermed., 3:92 (Nov.) 1876; Cited by Wright, Jacobs and Walton.[3]

We found larger numbers of larvae in our positive specimens than did McNaught and Anderson. They state that they found fewer than 20 larvae in each 50 Gm. of diaphragm muscle in 79 per cent of their subjects, between 20 and 100 larvae in 12.5 per cent and more than 100 in 8.5 per cent. We found fewer than 20 in 31 per cent of our positive specimens, from 20 to 100 in 15 per cent and over 100 in 54 per cent.

CONCLUSION

It appears that there has been a real reduction in Trichinella spiralis infections in San Francisco. Three factors would appear to be responsible for this, though their relative importance cannot be evaluated.

Federal, state and local regulations that assure adequate processing of pork products intended to be eaten without cooking have undoubtedly played a large part, since many of the clinical cases have been traced back to these foods. The U. S. Department of Agriculture has recently reported [8] that surveys of ready-to-serve pork products prepared under federal meat inspection regulations have shown no infective larvae in a countrywide sampling conducted from July 1948 to December 1949. Continued vigorous enforcement of processing regulations and their enactment and use in local areas where they are not in effect is necessary.

A reduction in the proportion of pork from garbage-fed hogs sold in San Francisco is a second factor. Wartime scarcity of labor, difficulties of transportation and other factors made feeding garbage to hogs relatively unprofitable, and many local establishments of this kind went out of business. There are none at present in San Francisco County. It is also said by persons well acquainted with the meat-packing industry [9] that garbage-feeding is less satisfactory than it was because of the lower quality garbage presently obtainable, and that the preparation of grain-fed pork has increased. There is evidence in the Department of Agriculture report that the reduction of infections in hogs is widespread, for only 0.81 per cent of the pork product specimens was found to contain killed larvae in the 1948-1949 samples, as compared with an infection rate of 3.32 per cent in the period March 1934 to August 1939. While we have no evidence that garbage-feeding of hogs is again increasing, it would seem to be a good time to establish regulations requiring the cooking of garbage used for this purpose against the day when the practice might be resumed on a wider scale.

Public education on the necessity of the thorough cooking of pork must have played some part, and this should be continued. The lessening incidence of the infection of hogs and the reduction of clinical cases of trichinosis, which may be observed in other places as well as in San Francisco, should not be accepted as the justification for neglecting this phase of health education. The possibility of obtaining meat from an occasional heavily infected hog still remains and will remain despite the application of any reasonably practical control measures; the risk of death and of severe disability will, therefore, still persist, but this risk can be reduced to nothing if people will insist on the thorough cooking of fresh pork.

SUMMARY

Fifty gram portions of diaphragms from 161 unselected autopsies done in San Francisco between November 1949 and June 1950 were examined for larvae of Trichinella spiralis by digestion with pepsin and hydrochloric acid. Thirteen (8 per cent) contained parasites. This contrasts with the finding of 24 per cent in a series of 200 autopsies, studied by the same method, reported by McNaught and Anderson in 1936. This is attributed to the lessened use of garbage-fed pork, more stringent regulation of the production of ready-to-serve pork foods and public education on the necessity of cooking pork.

ABSTRACT OF DISCUSSION

DR. FRANK B. QUEEN, Portland, Ore.: This is the first time that a repeat study has been made in the same territory and city utilizing the same methods by which a previous study was made. Studies of the incidence of trichinosis beginning about 1933 in various parts of the United States give a good cross section of incidence, with an average of about 16 per cent infection. The highest found was 36 per cent (Cleveland). Beard's study shows a reduction in the incidence of trichinas infection in San Francisco since McNaught's study in 1936 of 24 per cent to eight per cent. The question arises whether or not this reduction indicates a true reduction of trichinosis infection, or is it simply within the variations of biological studies? One cannot answer this with certainty, though I believe that it well may be the latter. In St. Louis there was a 5 per cent infection rate found in 1891 but a percentage of 15.4 in 1937, when a more extensive study (using a different method) was made. In 1936 in New Orleans, 3.5 per cent infection was found, though three years later another study showed exactly twice that amount. These studies were technically comparable. I believe that these changes are due to chance variations among the persons studied, and that Beard's results may be due to this and not to the fact that the incidence of trichinas infection in San Francisco has truly dropped from 24 per cent to 8 per cent during the past 14 years. By age groups in large series, trichinosis infections are found in ages 10 to 29, 4 per cent; 30 to 39, 12 per cent, and 40 to 49, 17 per cent, while the maximum of 25 to 35 per cent is found after age 50. Thus, even had trichinosis been completely controlled in San Francisco after McNaught's study 14 years ago, such control would not yet account for the reduced infection rate of 8 per cent now found and particularly since but 12 (7 per cent) of Beard's cases were under 24 years of age. I believe that it is not a matter of a decrease in trichinosis but a matter of sampling giving a possible erroneous interpretation. But there is no way to know this except through continued studies like this one.

DR. RICHARD D. FRIEDLANDER, San Francisco: I do not believe that the present methods of approaching the trichinosis problems are adequate. This paper has been concerned with spot checks on human diaphragms; I do not believe that the primary interest of the medical profession is in the number of larvae in the diaphragms of dead people. By skin-testing swine for trichinosis, a specific measure, the differentiation of swine showing positive tests comparable to that done in tuberculous or brucellous cows, one might provide a solution to the eradication of trichinosis, i. e., either slaughter or at least detection of such swine. This involves an economic problem. The public health status of this problem has changed little since the same point was raised eight years ago when McNaught presented a similar paper.

DR. ELMER W. SMITH, Stockton, Calif.: A question came to mind when Beard mentioned the cooking of garbage. While I was at St. Mary's Hospital in this city a South San Francisco physician brought blood from 31 patients into the laboratory. The blood showed one incidence of over 15 per cent eosinophilia. One of these patients died of severe trichinosis. I did an autopsy examination and found serious lesions in the heart, gallbladder,

8. United States Department of Agriculture, Agricultural Research Administration, Washington, D. C., Press Release, April 12, 1950.

9. Forbes, E. F., and Wahn, A. J.: Personal communications to the author.

diaphragm and skeletal muscles. Tissues were sent to Dr. McNaught who, by the digestion method, found over 1,000 organisms to each gram of diaphragm muscle. Now, in attempting to uncover the source, my colleagues and I found that a group of people in the Italian section of South San Francisco were pooling their garbage and raising hogs. Quite an epidemic developed in the area. Now if the garbage had been boiled this problem would not have changed, because there is the problem of rats getting into the hog yards. Rats, being common carriers of Trichinella and also being cannibal, carry the infection from rat to rat. It is thus easy to see how the hogs became infected by catching and eating rats. Some of the raw Italian sausage was submitted to me, and it was found to be teeming with living Trichinella. These were given to Dr. Naught for evaluation. Therefore, the problem of rat population should be of important concern for the public health department.

DR. R. R. BEARD, San Francisco: In response to Queen, I believe that his comments are really important when he can describe two towns in which repeated surveys have been done under similar conditions and get such different variations. I can only offer statistics compiled by my colleagues and myself, which show that our difference is some four times the standard error, and I think it is unlikely that that is a chance occurrence. However, all I can do is to get a longer series, as Queen has said. In answer to Friedlander, I too have been attracted by the idea of testing hogs, but it is my understanding that skin-testing in hogs is not simple, nor yet a reliable procedure, and unfortunately serum hog-testing isn't too good either. Of course, if infected hogs could be destroyed, or if the meat from hogs that are thought to contain Trichinella could be treated by freezing, that might take care of the problem. The rat control approach to this problem has been mentioned frequently in the past, as it certainly should be on general grounds. However, rat control alone is by no means a reliable means of management. Rat control should be a part of the program in every community.

CLINICAL NOTES

ALCOHOL AND VIOLENT DEATH

A ONE YEAR STUDY OF CONSECUTIVE CASES IN A REPRESENTATIVE COMMUNITY

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and
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In 1941 Gonzales and Gettler [1] reported a study on alcohol and the pedestrian in traffic accidents in New York City. They disclosed that 30.7 per cent of the pedestrians killed in traffic accidents were under the influence of alcohol. Gonzales, Vance and Helpern [2] have stated that alcohol was a contributory or responsible factor in approximately 40 per cent of all violent deaths that came under their jurisdiction in the Medical Examiner's office of New York City. Since then the problem of alcohol in relation to violent death has intensified. Despite this, many observers have tended to underestimate the significance of these previously mentioned findings because it has been claimed that the cases were not consecutive in most of these studies or that the cases were drawn from areas not typical of the county or population as a whole. Although it has been indicated that alcohol is a contributory factor in a significant percentage of other forms of violent death, most of the previous studies have been concerned with the role of alcohol in traffic fatalities.

From the Office of the Medical Examiner, The Department of Laboratories and Research of Westchester County.

1. Gonzales, T. A., and Gettler, A. O.: Alcohol and Pedestrian in Traffic Accidents, J. A. M. A. **117**: 1523-1525 (Nov. 1) 1941.
2. Gonzales, T. A.; Vance, M., and Helpern, M.: Legal Medicine and Toxicology, New York, Appleton-Century-Crofts Company, Inc., 1937, p. 529.
3. Gettler, A. O., and Tiber, A.: Quantitative Determination of Ethyl Alcohol in Human Tissues, Arch. Path. **3**: 75-83 (Jan.) 1927.

TABLE 1.—*Violent Deaths Classified According to Alcoholic Content of Brain or Liver*

Type of Death	Total No. of Cases	Cases in Which Alcohol Is in Liver or Brain: No.	Cases in Which Alcohol Is in Liver or Brain: %	Average Alcoholic Content of Brain or Liver, %	Range of Alcoholic Content in Liver or Brain, %
Suicide	78	15	19	0.15	0.02-0.39
Nonindustrial accidental deaths	82	20	24	0.18	0.06-0.3
Homicides	8	7	87	0.18	0.11-0.25
Automobile fatalities	78	26	46	0.15	0.08-0.25
Totals	246	68	27	0.16	0.02-0.3

It is the purpose of this report to present the results of a one year (1949) study of the role of alcohol as a factor in all forms of violent death in a typical community with a population of approximately 600,000, in which there are several small cities, towns, villages, suburban and semirural areas. During this period practically every one who had died a violent death in the entire community was necropsied and the liver or brain analyzed for ethyl alcohol content. Necropsy was foregone only when it was absolutely clear that no alcohol was involved, when 24 hours had elapsed between the time of the accident and death and when circumstances beyond our control were present. In most instances death was almost instantaneous. The ethyl alcohol determinations therefore tended to approximate the exact state of the person at the time of accident or violent death. In each case, depending on the circumstances, either the brain or the liver was used for the ethyl alcohol determination. The method of Gettler and Tiber [3] was employed.

During the period of study approximately 500 cases were handled by this office. Two hundred and forty-six of the 500 cases were classified either as homicidal, suicidal or nonindustrial accidental death. All these have been included in this study. Thus, there was no selection of cases whatsoever. Of these, there were 78 suicides, 82 nonindustrial accidental deaths of adults, eight homicides and 78 traffic fatalities of which 13 were pedestrians and 65 driver or passenger. The incidence of passenger and driver deaths was greater than that of pedestrian deaths. This is in contrast to what occurs in a large city where the pedestrian deaths outnumber the car occupant deaths. The accompanying table presents the type of violent death, the number of persons in each classification, the number with positive ethyl alcohol

TABLE 2.—*Classification of Alcohol Cases*

	Alcoholic Content of Brain, %
Trace	0.005-0.02
1 plus	0.02 -0.10
2 plus	0.10 -0.25
3 plus	0.25 -0.40
4 plus	0.40 -0.60

determinations in the brain or liver, the average alcohol content for those with positive determinations in each group and the minimum and maximum alcohol content in those with positive determinations in each group (table 1). Also included for reference is a table classifying cases according to amounts of alcohol recovered quantitatively in the brain [2] (table 2).

It may be noted that most of the cases in this report are in the 1 plus and 2 plus categories; these are the levels where, on casual examination, the persons may not appear to be under the influence of alcohol. Careful tests and studies, however, indicate that these are the persons most prone to get into trouble because their reflex actions, coordination and sense of judgment are impaired and yet they can get around and do not realize the extent of impairment. The persons in the 3 plus and 4 plus categories are obviously intoxicated and are often too far gone to get into serious trouble.

Ethyl alcohol as an immediate precipitating factor in the act of committing suicide was present in 15 (19 per cent) of the 78 suicides; of these, eight were men and seven women, respectively. Whether or not the alcohol was used to dull the senses so that the original intent of committing suicide might be pursued or whether or not the alcohol accentuated whatever depression was already present is difficult, of course, to ascertain. The presence of alcohol in this group very often makes it extremely difficult to render an accurate decision in these cases—that is, whether the death is an accident or a suicide.

There were 82 nonindustrial accidental deaths in adults, and of these persons, 20 (24 per cent) were under the influence of varying degrees of alcohol. Among these accidents were examples of pots boiling over on the stove and causing asphyxiations by illuminating gas, fires in bed, falls, drownings and asphyxiations as a result of inspiration of large pieces of food. These persons represented all segments of the community, all classes and economic levels and varied occupations.

Seven of the eight acts of homicide were committed while the persons involved were under the influence of rather large quantities of alcohol. Investigation revealed that in practically all instances there was no obvious premeditation or malicious intent. Very often after the influence of the alcohol had subsided there was no real recollection of what had occurred. These homicides consisted of stabbings, beatings, etc.

Automobile fatalities present perhaps the most serious problem. It is in this field that the controversy rages as to the quantity of alcohol in the blood necessary to produce sufficient impairment of efficiency and to act as a contributing or responsible factor in a traffic fatality. In a recent careful and well documented study in Sweden by Bjerver and Goldberg,[4] it was found that an alcoholic level in the blood of 0.04 to 0.06 per cent reduced driving efficiency by at least 25 to 30 per cent. In their tests they utilized only expert drivers. These investigators believe that the threshold levels of alcohol in the blood above which efficiency is significantly impaired is 0.035 to 0.04 per cent. In 1938, in a study on auto drivers in the region of Chicago, Holcomb [5] found that 47 per cent of 270 drivers involved in accidents were under the influence of alcohol, whereas only 12 per cent of 1,760 drivers picked up at random were under the influence of alcohol. He also concluded that when the alcoholic level in the blood was 0.1 per cent accidents were four to six times as frequent, and at a 0.15 per cent level accidents were 25 times as frequent.

Of the 78 traffic fatalities in this report, again all economic levels, all groups and all occupations were represented. For the most part, the persons involved were not chronic alcoholics but people who had been drinking at a cocktail party, a tavern, a wedding or a holiday celebration.

All the figures on alcohol presented here are minimal figures. Alcoholic levels in the brain or liver are lower than the level obtained in the blood. In some instances the persons died several hours after the accident or other form of violent death had occurred, so that the determination at the time of postmortem examination was considerably lower than it most likely was at the time of the accident.

This entire problem assumes added significance when it is recalled that in the age group of 15 to 45, the prime of life, two of the five leading causes of death in the entire nation are traffic fatalities and accidental deaths other than traffic fatalities.

SUMMARY

A one year study in a typical community revealed that ethyl alcohol was a contributing or responsible factor in 68 (27 per cent) of 246 consecutive cases of violent death.

4. Bjerver, K., and Goldberg, L.: Effects of Alcohol Ingestion on Driving Ability: Results of Practical Road Tests and Laboratory Experiments, Quart. J. Stud. on Alcohol **11**: 1-30 (March) 1950.

5. Holcomb, R. L.: Alcohol in Relation to Traffic Accidents, J. A. M. A. **111**: 1076-1085 (Sept. 17) 1938.

ACUTE FULMINATING HODGKIN'S DISEASE

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Since Thomas Hodgkin [1] in 1832 first described seven cases of common lymph node and spleen enlargement and cachexia terminating fatally, a voluminous literature about the nature and etiology of this disease has accumulated. The most recent and complete review of this subject is that of Hoster and Dratman.[2] Acute cases of Hodgkin's disease are rare. Cunningham [3] found three cases; one was of six weeks' duration. Sternberg [4] collected a number from the literature in which the duration was from eight days to several weeks. Harrell [5] cited a case that was characterized by much pus formation and necrosis with very little fibrosis.

From Kanawha Valley Hospital, Charleston, W. Va.

1. Hodgkin, T.: On Some Morbid Appearances of the Absorbent Glands and Spleen, Tr. Med.-Chir. Soc. Edinburgh **17**: 68-114, 1832.

2. Hoster, H. A., and Dratman, M. B.: Hodgkin's Disease (Part I) 1832-1947, Cancer Research **8**: 1-48, 1948.

3. Cunningham, W. F.: Hodgkin's Disease: A Study of a Series of 25 Cases, Am. J. M. Sc. **150**: 868-886, 1915.

4. Sternberg, C.: Lymphogranulomatose und Reticuloendotheliose, Ergebn. d. allg. Path. u. path. Anat. **30**: 1-76, 1936.

5. Harrell, G. T.: Hodgkin's Disease with Invasion of Pericardium and Gall Bladder, Arch. Path. **28**: 58-64, 1939.

Gilbert [6] analyzed the clinical course of 77 patients and made the following classification of cases: (1) those with an average rate of development (60 per cent), (2) those of slow evolution (20 per cent), (3) a rapid form in which death results within months and (4) the acute form (rare). These acute cases may run their complete course during a period of a few weeks with a high fever and rapid spread suggesting septicemia. In some, all the lymph nodes seem to enlarge at the same time. In this report no actual cases were described. In view of the apparent rarity of this form of Hodgkin's disease, the following case is reported.

REPORT OF CASE

A 16 year old male was admitted to the hospital Dec. 30, 1949, complaining of chest pain and cough of three days' duration. He had been well until he began to have fever, generalized aching, pain in the right lower portion of the chest, shortness of breath, unproductive cough, anorexia and occasional vomiting unrelated to meals. The family history was noncontributory. Two weeks prior to this illness, the patient was tattoed over the anterior aspect of the left forearm. This was followed by redness, swelling and tenderness, lasting about three days. Physical examination revealed a well developed, well nourished, acutely ill, white male. The temperature was 101 F., pulse 120 per minute, respirations 30 per minute and blood pressure 100/80. The findings otherwise were not remarkable, except for a pleural friction rub in the midaxillary line of the right lower portion of the chest. The clinical diagnosis was acute fibrinous pleurisy of the base of the right lung.

The red blood cell count was 5,040,000, with 97 per cent hemoglobin, and the white blood cell count was 15,750. The differential count was neutrophils 58 per cent, band cells 8 per cent, lymphocytes 30 per cent, monocytes 1 per cent, eosinophils 2 per cent and basophils 1 per cent. Results of urinalysis were essentially normal. Results of agglutination tests with typhoid, paratyphoid, Proteus 0X19 and 0X2, Brucella Abortus and B. tularense antigens were negative on two occasions. Results of the Mazzini and Hinton tests were negative. Sputum concentration examinations were negative for tubercle bacilli. The heterophil antibody reaction was negative. Blood cultures were negative. X-ray examination of the chest was considered normal on repeated examinations.

The patient ran a septic type of fever that ranged between 100 and 105 F., and there was a progressive evidence of toxemia. Five days after admission, he had severe bilateral chest pain, tachypnea and pleural friction rubs bilaterally over the lung bases. The liver was slightly palpable and tender. Splenic enlargement was noted on percussion, but the organ was not palpable. The conjunctivas were injected, and the scleras were slightly icteric. There was generalized adenopathy. The nodes measured from 0.5 to 1 cm. in diameter; they were discrete and nontender. A clinical diagnosis of acute Hodgkin's disease was considered. A lymph node biopsy specimen was obtained from the right axilla, and the pathological diagnosis was Hodgkin's disease.

On January 5, the hemoglobin was 75 per cent, red blood cell count 3,700,000 cells and the white blood cell count was 37,150. The differential count showed lymphocytes 15 per cent, monocytes 29 per cent, neutrophils 23 per cent, band cells 31 per cent and eosinophils 2 per cent. The urine showed an increased amount of urobilinogen, and the blood van den Bergh reaction was 1.2 mg. direct and 2.8 mg. indirect, per 100 cc. The Hanger liver function test showed 4 + at 24 and 48 hours. On January 6, the liver and spleen were definitely larger, the jaundice deepened and the glandular enlargement became more prominent. The patient became confused and delirious. Despite multiple transfusions, the anemia progressed and the white blood cell count rose to 58,900. On January 8, there was intense jaundice, marked hepatosplenomegaly and generalized purpura. The course was rapidly downhill, and the patient died Jan. 11, 1950, 12 days after admission and 15 days after the onset of the illness.

Autopsy Findings.—The body was that of a well developed, well nourished, white male who was moderately icteric and appeared to be about 17 years of age. There was a tattoo on the left forearm. The right axilla showed a recent surgical incision. The peritoneal cavity contained about 500 cc. of a deep yellow fluid. Each pleural cavity contained 200 cc. of a similar fluid. The pericardial sac was not abnormal. The heart weighed 280 Gm. and showed cloudy swelling of the myocardium and an old healed verrucous endocarditis of the aortic valve. The lungs showed edema, passive hyperemia and foci of acute bronchopneumonia. The liver weighed 2,000 Gm.; it was semifirm and was yellow on section. The acinar markings were distinct. The gallbladder and extrahepatic bile ducts revealed no gross abnormalities. The spleen weighed 500 Gm. It was firm and on section was purple-red and contained numerous gray-white opaque areas, measuring up to 0.5 by 0.4 by 0.2 cm. The suprarenal glands weighed 10 Gm. together and showed a diminution of cortical lipoid. The kidneys weighed 300 Gm. together and showed pronounced passive hyperemia. The renal pelvises were pink-gray and smooth and showed petechial hemorrhages. The urinary bladder, prostate gland and seminal vesicles were normal. The mucosa of the stomach and small and large intestines showed petechial hemorrhages. The axillary, mediastinal, perigastric, mesenteric and para-aortic lymph nodes were enlarged up to 3 by 2 by 2 cm. They were discrete, semifirm and on section showed a uniform gray surface, more opaque than normal and bulging. The rib and sternal marrow was red. Permission was not granted for examination of the brain.

Microscopic Examination.—The lesions of Hodgkin's disease were found in the lymph nodes, liver, spleen and kidneys. These were characterized by loss of architecture, foci of necrosis, Sternberg-Reed cells, pleomorphism and the infiltrations of lymphocytes, plasma cells, eosinophils and polymorphonuclear leukocytes. Fibrosis was not seen. The liver showed Hodgkin's granuloma extending into the lobules from the periportal areas. The liver cells showed cloudy swelling and fatty metamorphosis. In the kidneys there were focal areas of Hodgkin's granuloma in the cortex with disappearance of the nephrons.

The pathological diagnosis was acute fulminating Hodgkin's disease with hepatomegaly, splenomegaly, involvement of kidneys and axillary, mediastinal and abdominal lymph nodes; icterus; ascites and bilateral hydrothorax; edema of the lungs; bilateral acute basal bronchopneumonia; petechial hemorrhages in the mucosa of the gastrointestinal tract and renal pelvises, and old healed verrucous endocarditis of the aortic valve (rheumatic in type).

COMMENT

The majority of cases of Hodgkin's disease are said to progress through three stages [7]: (*a*) a period of latency, during which the nodes are enlarging without symptoms, (*b*) a period of progression and generalization, during which symptoms of varying severity appear, and (*c*) a period of cachexia, which precedes the death of the patient. In the fulminating case, the stages rapidly merge, without any apparent sequence of events, and all the symptoms make their appearance at the start.

Attempts have been made to divide Hodgkin's disease into various categories according to its microscopic characteristics. Jackson and Parker [8] describe three types, the paragranuloma, the granuloma and the sarcoma. They stated, however, that transition forms may occur that are difficult to classify. Furthermore, the more benign forms (paragranulomas) may undergo transitions toward the more malignant forms, while the reverse is not true. Such a histological classification does not seem justified, because a single group of lymph nodes may show all the variants of the pathological picture. There is no pathological basis for a clinical division into acute

6. Gilbert, R.: Radiotherapy in Hodgkin's Disease, Am. J. Roentgenol. **41**: 198-241, 1939.
7. McCausland, D. J. M.: Hodgkin's Disease in Children, Arch. Dis. Childhood **16**: 59-62, 1941.
8. Jackson, H., Jr., and Parker, F., Jr.: Hodgkin's Disease: II. Pathology, New England J. Med. **231**: 35-44, 1944.

and chronic forms, since both exhibit the same morphological changes but with a different chronological spacing.

The blood changes in Hodgkin's disease vary with the type and the stage of the disease.[9] In the advanced stages there is progressive anemia, either from hypoplasia of the marrow or from development of the Hodgkin's disease in the marrow cavity. The anemia is usually of the hypochromic type, and the platelets are usually increased in number. Early in the disease the white blood cell count may be normal, slightly decreased or slightly increased. Occasionally, the leukocyte count may rise to 50,000 or over 100,000 per cubic millimeter. The leukocytosis is neutrophilic in type and occasionally eosinophilic. A definitely elevated white blood cell count in Hodgkin's disease is said to indicate that the disease is widely disseminated. With the progress of the disease the lymphocytes decrease in number to low levels and the monocytes may be increased. About 50 per cent of patients with Hodgkin's disease die in the toxic state attending multiple visceral invasion or terminal disease associated with secondary infection.[10] Although this is encountered more often in the acute cases, in many of the chronic forms symptoms of acute toxemia may suddenly develop, and the patient may die.

SUMMARY

A case is presented of acute fulminating Hodgkin's disease, characterized by pronounced toxemia, generalized lymph node enlargement, hepatosplenomegaly, jaundice and purpura.

SUICIDE FOLLOWING CORTISONE TREATMENT

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The mental and psychic effects of cortisone and pituitary adrenocorticotropic hormone (ACTH) have been observed almost from the initial use of these two drugs in man. A state of euphoria is very commonly observed during the course of the drug administration. More serious abnormal behavior has been observed, however, and as a result it has been suggested that the drugs be used cautiously or not at all for patients who have had previous mental difficulties. The literature on these drugs states that latent mental abnormalities may flare up with the use of these drugs.

The following case is reported because suicide occurred during the use of cortisone by a patient who had experienced no previous mental difficulties. On the contrary, she was greatly pleased with her progress, and she obtained a satisfactory remission of her rheumatoid arthritis.

REPORT OF CASE

Mrs. L. H., a housewife aged 53, complained of arthritis of 25 years' duration, beginning in the feet and gradually involving all other joints. The joints had become swollen and red in the early stages, but not recently. There had been marked difficulty in walking because of the pain. There had been blurring of the vision of the right eye due to an old iritis. There were no other symptoms referable to the respiratory, gastrointestinal, cardiovasculorenal, endocrine, central nervous, genitourinary or skeletomuscular systems.

On physical examination, the general nutrition appeared fair. The right pupil was constricted and irregular, reacting only slightly to direct light. The left pupil was normal. The visual fields were normal. The nose and throat were normal. There were four remaining lower teeth, which were in good repair. The thyroid gland could not be felt. There were no nodes felt in the neck, groins or axillas. The breasts were normal. The lungs were clear throughout. There was no heart enlargement, arrhythmia or murmur. Blood pressure was 142/80. The abdomen was scaphoid, without tenderness, spasm or masses. Liver, kidneys and spleen could not be felt. Motion was extremely limited and painful in the left hip. The knees were considerably enlarged, with marked crepitation. The range of flexion was normal, but extension was limited to about 165 degrees in both knees. The hips and ankles appeared normal. A 3 plus curling of the toes was present. The patient was unable to comb her hair because of soreness and limitation of motion in the shoulders and elbows. The wrists were deformed, were in good position, and had a motion range of 5 degrees hyperextension and 10 degrees flexion. There were typical fusiform deformities of the proximal interphalangeal joints.

The ophthalmological examination showed that her right pupil was round, was 3 mm. in diameter and reacted slowly, apparently owing to adhesions at the iris margins; the anterior chamber was slightly shallow. The left pupil was 4 mm. in diameter and reacted normally. After dilatation of the pupils, it was apparent that the right pupil was bound down by posterior synechiae. The tension was normal. A cataract was present. It was impossible to determine with the biomicroscope whether there were any floating capacities in the aqueous. The fundus could not be seen. On the left side, the pupil was almost round and slightly flattened above; the media were clear, the nerve head and macula, normal. Vessels showed a 1 + crossing, with a normal fundus.

Her blood count revealed a hemoglobin content of 11.8 Gm.; 4,200,000 red blood cells; 6,200 white blood cells; 5 per cent nonsegmented and 55 per cent segmented neutrophils; 31 per cent lymphocytes; 11 per cent monocytes; 2 per cent eosinophils. The sedimentation rate was 100 mm. in one hour. The eosinophil count revealed 131 eosinophils per cubic millimeter. The results of urinalysis were as follows: specific gravity, 1.014; color, light; sediment, cloudy; reaction, slightly alkaline; sugar, 0, albumin, 30 mg. per 100 cc.; no acetone, loaded with bacteria. The blood potassium level was 3.46 mg. per 100 cc.

X-ray examination of hands and hips showed considerable soft tissue swelling and bone atrophy, with hypertrophic degenerative changes in the proximal line of both wrists; a study of the right hip showed no abnormalities; a study of the left hip, however, revealed degenerative changes with narrowing of the joint space and irregularity of the head of the femur and the acetabulum. Considerable eburnation and deepening of the acetabulum had taken place.

Course in Hospital.—The patient remained in the hospital from Aug. 25 to Sept. 23, 1950. She received during that time a total of 2.625 Gm. of cortisone. By September 3 there had been marked improvement. She still complained of pain in the left hip, thigh and knee on change of position, and of some pain in the right shoulder. There was considerable recession of the swelling, but there was still some residual pain on active motion in all the joints. On September 15 there was evidence of continued improvement of motion of the left hip and left knee, in which motion was now unrestricted. The patient had begun walking. On the date of her discharge, September 23, the patient's sedimentation rate was 21 mm., she was walking about, happy, and was sent to her family physician with instructions that she receive 100 mg. of cortisone biweekly.

She was in excellent spirits when she returned home, although nervous, restless and sleeping poorly. Her husband and daughter, on returning from a fire down the street, found her "wild eyed,

9. Isaacs, R.: Hodgkin's Disease, M. Clin. North America **28**: 201-213, 1944.

10. Cohn, S., and Richter, M.: Modern Views of Hodgkin's Disease, M. Rec. **148**: 243-246, 1938.

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hysterical and screaming that "the devil was after her." The pastor was called, and he succeeded in quieting her. One of us saw her at 10: 30 p. m., and sedation was prescribed. She said she needed a doctor for her soul, not a medical doctor. The family was advised never to leave her alone, but on the same day, while her daughter was dressing, the patient cut her throat with a straight-edged razor and died within five minutes.

COMMENT

This patient's family history was essentially negative for depression. Her mother, aged 78, and father, aged 88, are living and well. She was one of five children. A brother died at 24 from carcinoma of the prostate. A sister prior to thyroidectomy for thyrotoxicosis was depressed and irrational but improved after surgery. A brother and another sister are living and well. All siblings had a history negative for mental disturbance, except as noted above. The mother and husband vouch for the absence of previous depression or nervousness. The patient had always been a quiet, normally religious woman.

To reason that the patient's mental disturbance was the result of the use of cortisone may be a *post hoc, ergo propter hoc* fallacy. But the evidence is strong that cortisone was responsible for her suicide, and if this is true, physicians must be alert to such a possibility in similar instances, especially now that the tablet form of cortisone can be purchased at the corner drug store.

COUNCIL ON PHYSICAL MEDICINE AND REHABILITATION

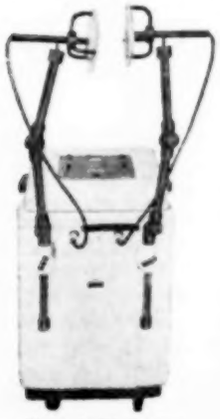
The Council on Physical Medicine and Rehabilitation has authorized publication of the following reports.

HOWARD A. CARTER, *Secretary.*

HANOVIA MEDICAL DIATHERMY, 27.12 MEGACYCLES, ACCEPTED

Manufacturer: Hanovia Chemical & Mfg. Company, 100 Chestnut Street, Newark 5, N. J.

The Hanovia Medical Diathermy, 27.12 Megacycles, is a generator of short wave diathermy for application by air spaced electrodes, electro-induction cable, drum applicators, and electrodes for minor surgery. Operating from a source of 60 cycle alternating current at 110 or 220 volts, it is designed to produce a wavelength of 11.03 meters free from harmonics and spurious radiations. It bears Type Approval No. D-523 of the Federal Communications Commission. It draws 1,200 watts.



Hanovia Diathermy No. 27300B

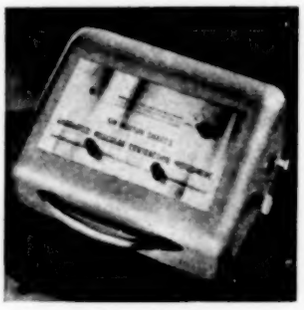
The apparatus is housed in a cabinet that rolls on the floor on casters. It stands 97 cm. (38 inches) high and weighs 92.5 Kg. (206 lb.). For shipment it makes a package measuring 116 by 70 by 67 cm. (41½ by 27½ by 26½ inches) and weighing 141 Kg. (310 lb.). The foreign shipping weight is 141 Kg. (310 lb.).

Evidence from a laboratory acceptable to the Council showed that the apparatus was sound in construction and dependable in operation. The Council on Physical Medicine and Rehabilitation voted to include the Hanovia Medical Diathermy, 27.12 Megacycles, in its list of accepted devices.

SIR MORTON SMART'S GRADUATED MUSCLE CONTRACTION UNIT ACCEPTED

Manufacturer: General Electric X-Ray Corporation, 4855 West Electric Avenue, Milwaukee 14.

Sir Morton Smart's Graduated Muscle Contraction Unit is a device intended to stimulate human muscles in the treatment of certain disorders of muscles, nerves and joints. It is about the size of a portable typewriter, can be carried by a handle and set on a table, and is plugged into any outlet for 60 cycle alternating current at 115 volts.



Sir Morton Smart's Graduated Muscle Contraction Unit

The over-all dimensions of the unpacked article are 30.5 by 37 by 16 cm. (12 by 14½ by 6¼ in.) and it weighs 5.9 Kg. (13 lb.). Packed for shipment it makes a package measuring 33 by 42.5 by 20 cm. (13 by 16¾ by 7¾ in.). The domestic shipping weight is 7.7 Kg. (17 lb.); the foreign is 22.5 Kg. These shipping weights include the following accessories: 1 felt disk electrode 38 mm. (1½ in.) in diameter; 1 button type disk electrode 13 mm. (½ in.) in diameter; 1 dispersive electrode, 15 by 20 cm. (6 by 8 in.); 1 handle for disk electrode; and 1 set of paired electrode cords.

Evidence was obtained from sources acceptable to the Council that this device was a satisfactory generator of faradic current.

The Council on Physical Medicine and Rehabilitation voted to include the Sir Morton Smart's Graduated Muscle Contraction Unit manufactured by the General Electric X-Ray Corporation in its list of accepted devices.

MICROTONE ADC AUDIOMETER, MODEL 53-A, ACCEPTED

Manufacturer: The Microtone Company, Ford Parkway on the Mississippi, St. Paul 1.

The Microtone ADC Audiometer, Model 53-A, is a portable pure tone audiometer. The audiometer requires a source of alternating current at 60 cycles and 115 volts. It draws 30 watts, corresponding to 0.3 ampere. It weighs 7.5 Kg. (16 lb.) and measures 25 by 23 by 33 cm. (10 by 9 by 13 in.). When packed for shipment it makes a package measuring 30 by 28 by 39.5 cm. (11¾ by 11 by 15½ in.) and weighing 9.5 Kg. (21 lb.). The foreign shipping weight is the same.

Satisfactory evidence was obtained that this device satisfied the requirements formulated for screening audiometers without bone conduction receivers by the Advisory Committee on Audiometers and Hearing Aids.

The Council on Physical Medicine and Rehabilitation voted to include the Microtone ADC Audiometer, Model 53-A, in its list of accepted devices.

OTARION HEARING AID, MODEL G-1, (WHISPERWATE), ACCEPTED

Manufacturer: Otarion, Inc., 159 North Dearborn Street, Chicago 1.

The Otarion Hearing Aid, Model G-1, (Whisperwate) is a conventional electric hearing aid. Its external dimensions, exclusive of clips, control wheel, etc., are 62 by 46 by 22 mm., and the transmitter unit without batteries weighs 62 Gm. It operates on an A-battery at 1.25 volts and B-battery at 15.0 volts. It is provided with a magnetic air conduction receiver. A single control adjusts volume and tone at the same time, so that as the output increases the low tones increase relatively to the high tones. The Council on Physical Medicine and Rehabilitation voted to include the Otarion Hearing Aid, Model G-1, (Whisperwate) in its list of accepted devices.

MEDICAL LICENSURE STATISTICS FOR 1950

FORTY-NINTH ANNUAL PRESENTATION OF LICENSURE STATISTICS BY THE COUNCIL ON MEDICAL EDUCATION AND HOSPITALS OF THE AMERICAN MEDICAL ASSOCIATION

Donald G. Anderson, M.D., Secretary, and Anne Tipner

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Statistical compilations regarding medical licensure are presented annually in the State Board Number of THE JOURNAL. The report for 1950 constitutes the forty-ninth annual presentation. Data are included pertaining to a) medical examining and licensing boards of the United States, the District of Columbia and the territories and outlying possessions of the United States, b) the boards of examiners in the basic sciences and c) the National Board of Medical Examiners.

The computations presented are based on official records received throughout the year from the medical examining and licensing agencies of all states, Alaska, Hawaii, Puerto Rico, Guam and the Virgin Islands, the twenty boards of examiners in the basic sciences and the National Board of Medical Examiners. This presentation is made possible because of the whole-hearted cooperation of these agencies. The Council and THE JOURNAL gratefully acknowledge their appreciation to those who have supplied these data as well as other records furnished throughout the year.

The tables referring to medical licensing boards present figures pertaining to the number of candidates examined, the numbers licensed and the number who represent additions to the physician population. There are also included other pertinent data pertaining to the regulations for medical licensure. The state boards are discussed first, followed by the basic science boards and the National Board of Medical Examiners.

STATE BOARDS OF MEDICAL EXAMINERS

Licenses Issued

In 1950, 12,209 licenses to practice medicine were issued by the medical examining boards of the forty-eight states, the District of Columbia, Alaska, Guam, Hawaii, Puerto Rico and the Virgin Islands. The number licensed in each state by examination or by the endorsement of credentials is shown in table 1. Of the 12,209 licenses issued, 5,454 were granted after examination and 6,755 by reciprocity and endorsement of state licenses or the certificate of the National Board of Medical Examiners.

Physicians certified in a given year after written examination in all instances were not tested in that year. The licensing boards of 24 states, the District of Columbia, Alaska, Guam, Hawaii, Puerto Rico and the Virgin Islands require a year of internship for licensure. The candidate for medical licensure in some of these states is per-

TABLE 1.—*Licenses Issued, 1950*

	Examination	On the Basis of Reciprocity and Endorsement	Total
Alabama	36	92	128
Arizona	8	50	58
Arkansas	74	42	116
California	519	837	1,356
Colorado	76	79	155
Connecticut	24	216	240
Delaware	23	7	30
District of Columbia	24	154	178
Florida	332	0	332
Georgia	147	78	225
Idaho	2	54	56
Illinois	394	251	645
Indiana	112	134	246
Iowa	61	124	185
Kansas	96	63	159
Kentucky	89	75	164
Louisiana	189	84	273
Maine	19	55	74
Maryland	190	133	323
Massachusetts	40	265	305
Michigan	156	264	420
Minnesota	201	147	348
Mississippi	63	69	132
Missouri	202	148	350
Montana	5	35	40
Nebraska	96	33	129
Nevada	0	19	19
New Hampshire	6	47	53
New Jersey	41	232	273
New Mexico	2	70	72
New York	290	871	1,161
North Carolina	97	133	230
North Dakota	35	9	44
Ohio	314	297	611
Oklahoma	58	63	121
Oregon	38	57	95
Pennsylvania	325	262	587
Rhode Island	12	19	31
South Carolina	59	45	104
South Dakota	20	25	45
Tennessee	175	81	256
Texas	331	421	752
Utah	30	48	78
Vermont	13	30	43
Virginia	138	128	266
Washington	60	125	185
West Virginia	42	67	109
Wisconsin	130	132	262
Wyoming	2	27	29
Alaska, Guam, Hawaii, Puerto Rico and Virgin Islands	58	58	116
Totals	5,454	6,755	12,209

Marginal Number	SCHOOL	1 Alabama		2 Arizona		3 Arkansas		4 California		5 Colorado		6 Connecticut		7 Delaware		8 Dist. of Columbia		9 Florida		10 Georgia		11 Idaho	
		P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F
	ALABAMA																						
1	Medical College of Alabama, Birmingham	30	0															1	0	5	0		
	ARKANSAS																						
2	University of Arkansas School of Medicine, Little Rock					70	0	2	0							1	0						
	CALIFORNIA																						
3	University of California School of Medicine, San Francisco							72	1			1	0										
4	Coll. of Medical Evangelists, Loma Linda-Los Angeles			1	1			51	3									4	0				
5	Univ. of So. California School of Med., Los Angeles			1	0			67	0			1	0										
6	Stanford University School of Medicine, Stanford University-San Francisco			1	0	1	0	77	2	1	0	1	0										
	COLORADO																						
7	University of Colorado School of Medicine, Denver							4	0	56	0							1	0	1	0		
	CONNECTICUT																						
8	Yale University School of Medicine, New Haven									1	0	0	1	1	0			1	0				
	DISTRICT OF COLUMBIA																						
9	Georgetown University School of Med., Washington							2	0			1	0			3	0	6	0				
10	George Washington Univ. School of Med., Washington							3	0							1	0	4	2				
11	Howard University College of Medicine, Washington							1	1			1	1			7	1	3	0	1	0		
	GEORGIA																						
12	Medical College of Georgia, Augusta															1	0			14	0	8	0
13	Emory University School of Med., Emory University																			31	1	5	1
	ILLINOIS																						
14	Chicago Medical School							1	0			1	0					1	0				
15	Northwestern University Medical School, Chicago							14	0	1	0							7	1				
16	Stritch School of Med. of Loyola University, Chicago							5	0									4	1				
17	University of Chicago, The School of Medicine							7	0									2	0				
18	University of Illinois College of Medicine, Chicago							16	0	3	0					1	0	11	1				
	INDIANA																						
19	Indiana University School of Medicine, Bloomington-Indianapolis							5	0									7	0				
	IOWA																						
20	State University of Iowa College of Med., Iowa City							5	0									2	0				
	KANSAS																						
21	Univ. of Kansas School of Med., Lawrence-Kansas City							1	0														
	KENTUCKY																						
22	University of Louisville School of Medicine			1	0			2	1					1	0			5	2				
	LOUISIANA																						
23	Louisiana State Univ. School of Med., New Orleans							3	0									3	1				
24	Tulane University of Louisiana School of Medicine, New Orleans	2	0					3	0									15	1				
	MARYLAND																						
25	John Hopkins University School of Med., Baltimore							2	0			1	0	1	0			2	0				
26	University of Maryland School of Medicine and College of Physicians and Surgeons, Baltimore	1	0					2	0					2	0			6	1				
	MASSACHUSETTS																						
27	Boston University School of Medicine							1	0									3	0				
28	Harvard Medical School, Boston	1	0					4	0					1	0			8	0	1	0		
29	Tufts College Medical School, Boston													1	0			2	1				
	MICHIGAN																						
30	University of Michigan Medical School, Ann Arbor							3	0					1	0			4	2				
31	Wayne University College of Medicine, Detroit							3	0									2	0				
	MINNESOTA																						
32	University of Minnesota Medical School, Minneapolis							5	0									1	0				
	MISSOURI																						
33	St. Louis University School of Medicine							7	1									5	2				
34	Washington University School of Medicine, St. Louis							3	0	1	0	1	0										
	NEBRASKA																						
35	Creighton University School of Medicine, Omaha							3	2			1	2					1	0				
36	University of Nebraska College of Medicine, Omaha							1	0									1	0				
	NEW YORK																						
37	Albany Medical College, Albany									1	0							1	0				
38	State University of New York, State University Med. Center at New York City, Coll. of Med., Brooklyn													1	0			6	0				
39	University of Buffalo School of Medicine																	2	0				
40	Columbia University College of Physicians and Surgeons, New York							3	0									5	1				
41	Cornell University Medical College, New York							6	0									2	1				
42	New York Medical College, Flower and Fifth Avenue Hospitals, New York																	4	0				
43	New York University College of Medicine, New York	1	0															7	3				
44	University of Rochester School of Medicine and Dentistry							3	0														
45	State University of New York, Medical Center at Syracuse University, School of Medicine					1	0	1	0									2	0				

Marginal Number	SCHOOL	12 Illinois		13 Indiana		14 Iowa		15 Kansas		16 Kentucky		17 Louisiana		18 Maine		19 Maryland		20 Massachusetts		21 Michigan		22 Minnesota	
		P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F
	ALABAMA																						
1	Medical College of Alabama, Birmingham																						
	ARKANSAS																						
2	University of Arkansas School of Medicine, Little Rock																						
	CALIFORNIA																						
3	University of California School of Medicine, San Francisco																						
4	Coll. of Medical Evangelists, Loma Linda-Los Angeles	1	0			1	0									2	0			2	0	2	1
5	Univ. of So. California School of Med., Los Angeles																						
6	Stanford University School of Medicine, Stanford University-San Francisco									1	0												
	COLORADO																						
7	University of Colorado School of Medicine, Denver																						
	CONNECTICUT																						
8	Yale University School of Medicine, New Haven																						
	DISTRICT OF COLUMBIA																						
9	Georgetown University School of Med., Washington																						
10	George Washington Univ. School of Med., Washington															1	0	1	0			1	0
11	Howard University College of Medicine, Washington	3	0									2	0			6	0						
	GEORGIA																						
12	Medical College of Georgia, Augusta																						
13	Emory University School of Med., Emory University																						
	ILLINOIS																						
14	Chicago Medical School	15	0							1	0	1	0									3	0
15	Northwestern University Medical School, Chicago	66	0	1	0					3	0	4	0									3	0
16	Stritch School of Med. of Loyola University, Chicago	29	1	1	0					1	0											3	0
17	University of Chicago, The School of Medicine	20	0	2	0	1	0					1	0			1	0					2	0
18	University of Illinois College of Medicine, Chicago	100	1	3	0	3	0					1	0					1	0	5	0	6	0
	INDIANA																						
19	Indiana University School of Medicine, Bloomington-Indianapolis	4	0	93	1																	4	0
	IOWA																						
20	State University of Iowa College of Med., Iowa City	2	0			63	1																
	KANSAS																						
21	Univ. of Kansas School of Med., Lawrence-Kansas City	1	0	1	0			82	0													2	0
	KENTUCKY																						
22	University of Louisville School of Medicine	1	0							76	0											1	0
	LOUISIANA																						
23	Louisiana State Univ. School of Med., New Orleans	1	0									61	0			1	0						
24	Tulane University of Louisiana School of Medicine, New Orleans	3	0									97	1									1	0
	MARYLAND																						
25	John Hopkins University School of Med., Baltimore	5	0			1	0					1	0			60	0					4	0
26	University of Maryland School of Medicine and College of Physicians and Surgeons, Baltimore	3	0													68	1						
	MASSACHUSETTS																						
27	Boston University School of Medicine	2	0																			1	0
28	Harvard Medical School, Boston	1	0	1	0							1	0	3	0			1	0	3	0	1	0
29	Tufts College Medical School, Boston							1	0					2	0			1	0	1	0		
	MICHIGAN																						
30	University of Michigan Medical School, Ann Arbor	1	0																	1	0	3	0
31	Wayne University College of Medicine, Detroit																			1	0	2	0
	MINNESOTA																						
32	University of Minnesota Medical School, Minneapolis	10	1					1	0														
	MISSOURI																						
33	St. Louis University School of Medicine	5	0					1	0														
34	Washington University School of Medicine, St. Louis	8	0									1	0										
	NEBRASKA																						
35	Creighton University School of Medicine, Omaha	3	0	1	0	10	0	4	0													1	0
36	University of Nebraska College of Medicine, Omaha	2	0	1	0			1	0			1	0										
	NEW YORK																						
37	Albany Medical College, Albany											1	0										
38	State University of New York, State University Med. Center at New York City, Coll. of Med., Brooklyn											1	0			2	0						
39	University of Buffalo School of Medicine									1	0												
40	Columbia University College of Physicians and Surgeons, New York															2	0						
41	Cornell University Medical College, New York	1	0									1	0	2	0	1	0						
42	New York Medical College, Flower and Fifth Avenue Hospitals, New York																					2	0
43	New York University College of Medicine, New York	1	0							1	0			1	0							1	0
44	University of Rochester School of Medicine and Dentistry					1	0					1	0									1	0
45	State University of New York, Medical Center at Syracuse University, School of Medicine															1	0						

23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50						
Mississippi	Missouri	Montana	Nebraska	Nevada	New Hampshire	New Jersey	New Mexico	New York	North Carolina	North Dakota	Ohio	Oklahoma	Oregon	Pennsylvania	Rhode Island	South Carolina	South Dakota	Tennessee	Texas	Utah	Vermont	Virginia	Washington	West Virginia	Wisconsin	Wyoming	Alaska, Hawaii, Puerto Rico and Virgin Islands	Totals	Examined—Passed	Examined—Failed	Percentage—Failed	No. Boards Examined by	Marginal Number
P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F						
1	0																											37	37	0	0.0	4	1
								1	0										1	0								77	77	0	0.0	6	2
																			1	0			1	0			1	0	79	78	1	1.3	6	3
											1	0						1	0					2	0			1	0	74	70	4	5.4	13	4
1	0																												70	70	0	0.0	4	5
								1	0														2	0	1	0			88	86	2	2.3	9	6
1	0									1	0	1	0	1	0														67	67	0	0.0	9	7
		1	0					1	0										1	0									9	8	1	11.1	9	8
								2	1														2	0	1	0			20	19	1	5.0	8	9
											1	0		1	0								1	0			1	0	17	15	2	11.8	10	10
	6	0				2	0	2	6	10	0			4	0		2	0						1	0		2	0	62	53	9	14.5	16	11
																			1	0				1	0				97	97	0	0.0	5	12
																													83	82	1	1.2	2	13
	1	0						5	1																				27	26	1	3.7	8	14
4	0	4	6	2	0			0	1		1	0	3	0		1	0	1	0				3	0	12	0	4	0	1	0	154	152	2	1.3	22	15
	3	0	1	0				1	1				3	0			1	0	1	0				2	0	5	0	1	0	61	58	3	4.9	14	16
	2	0	1	0		2	0	2	0		2	0	1	0	2	0	1	0		1	0			3	0	2	0	1	0	57	57	0	0.0	22	17
3	0	2	0			1	0	4	2		4	0		2	0	1	0		1	0	1	0		1	0	2	0			177	173	4	2.3	23	18
1	0																												116	115	1	0.9	7	19
																			1	0				4	0				78	77	1	1.3	6	20
													2	0		1	0							4	0			1	0	95	95	0	0.0	9	21
								1	0	3	0	1	0	3	0				1	0				2	0	3	0	2	0	106	103	3	2.8	15	22
7	0													1	0												1	0	1	0	80	79	1	1.2	9	23
9	0										1	0							3	0					1	0		3	0	140	138	2	1.4	11	24
1	0										1	0		1	0				1	0									81	81	0	0.0	13	25
									2	0	1	0		2	0												1	0	90	88	2	2.2	10	26
															1	0									2	0			10	10	0	0.0	6	27
3	0								9	0	1	0			1	0						1	0		1	0	1	0	43	43	0	0.0	19	28
						1	0		1	0		1	0		0	1									1	0	1	0	15	13	2	13.3	12	29
						1	0												2	0					4	0	1	0	114	112	2	1.8	11	30
														1	0				1	0					1	0	1	0	71	71	0	0.0	9	31
								1	1	3	0								0	1			1	0	2	0	1	0	132	129	3	2.3	11	32
9	8	0			1	0		2	1	1	0			1	0										3	0	1	0	133	129	4	3.0	12	33
2	0	7	8	0						1	0						1	0						1	0		1	0	99	99	0	0.0	12	34
		2	2	0				1	0				2	1	1	0							3	0	1	0	1	0	63	58	5	7.9	17	35
		7	0	1									1	0				1	0										80	79	1	1.2	9	36
	1	0						1	0																1	0			6	6	0	0.0	6	37
								5	2					1	0								1	0	1	0	1	0	21	19	2	9.5	9	38
																									1	0			4	4	0	0.0	3	39
								4	1	1	0			2	0								1	0	1	0			23	21	2	8.7	10	40
		3	0					7	3			1	0	3	0			1	0	2	0								35	31	4	11.4	13	41
						1	0	3	3					1	0			1	0	1	0								16	13	3	18.7	7	42
						1	0	13	11														1	0	1	0	1	0	44	30	14	29.5	12	43
								4	0	1	0	1	0	2	0	1	0	1	0	1	0		3	0					20	20	0	0.0	12	44
								5	2																		0	1	13	10	3	23.1	6	45

23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50

Marginal Number	SCHOOL	1 Alabama P	F	2 Arizona P	F	3 Arkansas P	F	4 California P	F	5 Colorado P	F	6 Connecticut P	F	7 Delaware P	F	8 Dist. of Columbia P	F	9 Florida P	F	10 Georgia P	F	11 Idaho P	F
	NORTH CAROLINA																						
46	Duke University School of Medicine, Durham	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	11	0	..	..	..	..
47	Bowman Gray School of Medicine of Wake Forest College, Winston-Salem	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	0	..	..	..	..
	OHIO																						
48	University of Cincinnati College of Medicine	..	..	1	0	..	..	2	0	..	..	..	..	..	..	..	..	4	0	..	..	..	..
49	Western Reserve University School of Med., Cleveland	..	..	..	..	..	..	2	0	..	..	1	0	..	..	..	..	2	0	..	..	..	..
50	Ohio State University College of Medicine, Columbus	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..	9	1	..	..	..	..
	OKLAHOMA																						
51	Univ. of Oklahoma School of Med., Oklahoma City	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..	2	1	..	..	..	..
	OREGON																						
52	University of Oregon Medical School, Portland	..	..	..	..	..	..	11	0	1	0	..	..	..	..	..	..	..	..	..	..	..	..
	PENNSYLVANIA																						
53	Hahnemann Med. Coll. and Hospital of Philadelphia	..	..	..	..	..	..	6	0	..	..	..	..	3	0	..	..	2	0	..	..	..	..
54	Jefferson Medical College of Philadelphia	1	0	1	0	..	..	8	2	1	0	..	..	2	0	3	0	6	1	..	..	..	..
55	Temple University School of Medicine, Philadelphia	..	..	..	..	..	..	6	0	..	..	..	..	2	0	..	..	12	1	..	..	..	..
56	Univ. of Pennsylvania School of Med., Philadelphia	1	0	..	..	..	..	2	0	..	..	2	0	2	0	..	..	7	0	..	..	..	..
57	Woman's Med. College of Pennsylvania, Philadelphia	..	..	..	..	..	..	1	0	..	..	1	0	1	0	..	..	1	0	..	..	..	..
58	University of Pittsburgh School of Medicine	..	..	..	..	..	..	4	0	..	..	1	0	..	..	..	..	6	0	..	..	..	..
	SOUTH CAROLINA																						
59	Medical Coll. of the State of So. Carolina, Charleston	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	10	0	2	0	..	..
	TENNESSEE																						
60	University of Tennessee College of Medicine, Memphis	..	..	..	..	..	..	2	0	..	..	0	1	..	..	..	..	2	2	..	..	..	..
61	Meharry Medical College, Nashville	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..	7	1	2	1	..	..
62	Vanderbilt University School of Medicine, Nashville	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	8	0	..	..	..	..
	TEXAS																						
63	Southwestern Medical School of the University of Texas, Dallas	..	..	1	0	..	..	3	0	..	..	1	0	..	..	..	..	..	..	..	..	..	..
64	University of Texas School of Medicine, Galveston	..	..	..	..	..	..	5	0	..	..	..	..	..	..	..	..	1	0	..	..	..	..
65	Baylor University College of Medicine, Houston	..	..	..	..	..	..	3	1	..	..	..	..	..	..	..	..	1	0	..	..	..	..
	UTAH																						
66	University of Utah School of Med., Salt Lake City	..	..	..	..	..	..	16	0	2	0	..	..	..	..	..	..	..	..	..	..	..	..
	VERMONT																						
67	University of Vermont College of Med., Burlington	..	..	..	..	..	..	2	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	VIRGINIA																						
68	University of Virginia Dept. of Med., Charlottesville	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	8	0	..	..	..	..
69	Medical College of Virginia, Richmond	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	1	1	0	..	..
	WASHINGTON																						
70	University of Washington School of Medicine, Seattle	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	WISCONSIN																						
71	University of Wisconsin Medical School, Madison	..	..	1	0	..	..	2	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..
72	Marquette University School of Medicine, Milwaukee	..	..	..	..	..	..	9	0	1	0	1	0	1	0	..	..	3	0	..	..	..	..
	CANADA																						
73	University of Alberta Faculty of Medicine, Edmonton	..	..	..	..	..	..	2	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..
74	University of Manitoba Faculty of Med., Winnipeg	..	..	..	..	..	..	6	1	..	..	..	..	1	0	..	..	..	..	..	..	..	..
75	Dalhousie University Faculty of Medicine, Halifax	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
76	Queen's University Faculty of Medicine, Kingston	.	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..
77	University of Western Ontario Faculty of Medicine, London	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..	1	0	..	..	..	..
78	University of Toronto Faculty of Medicine, Toronto	..	..	..	..	..	..	4	0	..	..	..	..	..	..	..	..	1	1	..	..	..	..
79	McGill University Faculty of Medicine, Montreal	1	0	..	..	..	..	4	0	..	..	..	..	1	0	..	..	1	1	..	..	1	0
80	University of Montreal Faculty of Med., Montreal	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
81	Laval University Faculty of Medicine, Quebec	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	OTHERS																						
82	Foreign Medical Faculties	1	0	..	..	1	0	47	22	..	..	9	11	..	..	6	2	9	2	2	0	..	..
83	Extinct Medical Schools	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	5	1	..	..	..	..
84	Unapproved Medical Schools	..	..	..	..	1	0	2	0	..	..	..	..	..	..	..	..	16	12	1	0	..	..
85	Schools of Osteopathy	..	..	..	..	..	..	8	0	4	3	..	..	1	0	..	..	..	..	..	..	..	..
86	TOTALS	39	9	74	580	76	48	23	27	371	148	1	459	115	87	97	88	191	20	193	97	195	20
87	Totals—Examined—Passed	39	8	74	543	76	29	23	24	325	147	1	399	112	86	96	88	190	19	183	26	195	20
88	Totals—Examined—Failed	0	1	0	37	0	19	0	3	46	1	0	60	3	1	1	0	1	1	10	71	0	0
89	Percentage Failed	0.0	11.1	0.0	6.3	0.0	39.6	0.0	11.1	12.1	0.7	0.0	13.0	2.6	1.1	1.0	0.0	0.5	5.0	5.2	73.2	0.0	0.0
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22

P—Passed; F—Failed.

mitted to write the examination before or while serving an internship and, if successful, the license is issued on completion of the internship. Licenses are withheld in some states for other technicalities. In general, also, the licenses of physicians examined in December are dated and issued early in the following year. Table 1, therefore, includes some who were examined in 1949 and a few in previous years. The figures presented in this table will not correspond with succeeding tables which deal entirely with physicians examined for licensure within the year 1950.

Neither does this table, particularly the endorsement group, represent entirely individuals but includes persons who may have been licensed in more than one state in a given year; nor does the total represent additions to the medical profession, since a physician may have been

23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50						
Mississippi	Missouri	Montana	Nebraska	Nevada	New Hampshire	New Jersey	New Mexico	New York	North Carolina	North Dakota	Ohio	Oklahoma	Oregon	Pennsylvania	Rhode Island	South Carolina	South Dakota	Tennessee	Texas	Utah	Vermont	Virginia	Washington	West Virginia	Wisconsin	Wyoming	Alaska, Hawaii, Puerto Rico and Virgin Islands	Totals	Examined—Passed	Examined—Failed	Percentage—Failed	No. Boards Examined by	Marginal Number
P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F						
									1 0																			15	15	0	0.0	3	46
1 0								1	1 26	0 1	0 1	0		1 0					1 0					1 0			0 1	40	38	2	5.0	13	47
								0	1	1 0	76 2			1 0 1	0							2 0		2 0			1 0	98	95	3	3.1	13	48
1 0								1	3		89 0			1 0										2 0 1	0			105	102	3	2.9	10	49
								1	1		69 1			2 0 1	1								1 0	1 0				93	89	4	4.3	11	50
												76 0																85	84	1	1.2	5	51
1 0		1 0								1 0		24 1	1 0				1 0		1 0	1 0			6 0					56	55	1	1.8	15	52
						5 1		3	3		1 0			39 0						1 0	1 0			2 0			5 1	83	77	6	7.2	15	53
2 0 1 0		1 0				7 0		3	4 6 0		2 0			76 0					1 0					2 0 2 0		2 0	147	140	7	4.8	25	54
1 0		1 0				3 1		4	1 1 0 2 0		2 0		1 0	42 0		1 0 1 0		1 0						1 0 2 0			97	94	3	3.1	24	55
1 0					1 0	2 0		2	1 13 0					55 0	2 0				1 0 1 0	1 0							102	101	1	1.0	20	56
						1 0		1	0		1 0			12 0											1 0			22	21	1	4.5	11	57
						1 0					3 0			44 0													1 0	64	64	0	0.0	10	58
														1 0		54 0								1 0				71	71	0	0.0	7	59
1 0								2	1		2 0			4 0			2 0	70 0						2 0			1 0	113	108	5	4.4	15	60
2 0 9 0						1 0		1	4 7 0		1 0			2 0				31 0						2 0				80	73	7	8.7	16	61
2 0									2 0									35 0						1 0				52	52	0	0.0	9	62
4 0			1 0											1 0			1 0		46 2									60	58	2	3.3	8	63
														1 0					94 1									104	103	1	1.0	6	64
2 0														1 0					74 4								1 1	88	82	6	6.8	6	65
								1	0				1 0							23 0						1 0		49	49	0	0.0	11	66
						1 0															13 0			1 0				19	18	1	5.3	6	67
3 0								1	1 2 0									1 0			51 0		1 0 1 0				2 0	75	74	1	1.3	10	68
									2 0					4 0							77 0		11 0				1 0	100	99	1	1.0	8	69
																												0	0	0	0.0	0	70
1 0 1 0 1 0								1	0		2 0		1 0				1 0						4 0		41 0		2 0	70	70	0	0.0	16	71
						1 0		5	5		2 0			1 0								2 0			32 0		4 0	83	78	5	6.0	18	72
1 0					1 0																		1 0					8	8	0	0.0	6	73
									3 0											1 0		1 0 1 0			1 0			18	17	1	5.6	10	74
1 0												1 0																4	4	0	0.0	3	75
								2	0	2 0				1 0									1 0					11	9	2	18.2	9	76
								1	0	0 1				1 0											1 0			10	9	1	10.0	8	77
1 0								7	2	1 0	4 0			2 0 1 0								0 1 2 0			1 0			35	31	4	11.4	14	78
					2 0			5	1 3 0	2 0	1 0			3 0 1 0								1 0 2 0			1 0			44	42	2	4.5	21	79
																							1 0					3	3	0	0.0	3	80
								1	0												0 1							8	6	2	25.0	4	81
2 0					0 1	2 6		140	293	5 1	4 2	25	13 1	0		2	2 1	1 1	1 0	5 0		4 3		2 0	3 0			9 1	799	359	440	55.0	32	82
										2 0							1 0							1 0				15	14	1	6.7	8	83
1								7	13	3 0		1	0	1 0													2 1	118	45	73	62.2	12	84
			0 2			7 3		34	26			28	3				1 0		35 5			1 0		4 0				175	126	49	28.0	13	85
6	206	5	99	0	7	52	2	687	98	38	345	82	40	328	15	59	20	142	293	29	16	139	60	42	130	2	63	6,203	....	....	....	..	86
6	206	5	96	0	6	41	2	290	97	35	326	82	38	326	12	59	20	142	277	29	15	138	60	42	130	2	57	....	5,481	....	....	..	87
1	0	0	3	0	1	11	0	397	1	3	19	0	2	2	3	0	0	0	16	0	1	1	0	0	0	0	6	....	....	722	....	..	88
1.5	0.0	0.0	3.0	0.0	14.3	21.2	0.0	57.8	1.0	7.9	5.5	0.0	5.0	0.6	20.0	0.0	0.0	0.0	5.4	0.0	6.3	0.7	0.0	0.0	0.0	0.0	9.5	....	....	....	11.6	..	89
23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50						

licensed in more than one state during the year 1950. In tables 12, 13 and 14 (pages 356 and 357) can be noted the number who secured licenses for the first time and represent additions to the medical profession in the United States and its territories and outlying possessions.

Of the 12,209 licenses to practice medicine and surgery issued in 1950, the greatest number (1,356) were issued in California. New York licensed the next largest number 1,161. More than 500 physicians were registered in Illinois, Ohio, Pennsylvania and Texas. The fewest, 19, were licensed in Nevada.

A recapitulation of totals pertaining to licenses issued for fifteen previous years and for 1950 by both examination and reciprocity or endorsement of credentials is included in table 3. The variations shown for the years from 1936 to 1941, inclusive, were the result of the

noticeable increase in the licensure of graduates of foreign medical faculties. In 1946 the number licensed almost doubled the 1945 figure. The increase in 1946 and the succeeding years resulted from the increase in the production of physicians under the accelerated program in medical schools. The number of licenses issued annually continues to exceed the prewar years although the numbers are decreasing each year. In 1950 there was a slight increase of 28 over the previous year.

TABLE 3.—*Licenses Issued, 1935-1950*

	Examination	Reciprocity and Endorsement	Total
1935	5,725	2,194	7,919
1936	6,276	2,773	9,049
1937	6,629	3,205	9,834
1938	6,557	2,956	9,513
1939	6,400	2,872	9,272
1940	6,289	2,866	9,155
1941	6,057	2,762	8,819
1942	6,152	2,469	8,621
1943	6,062	2,340	8,402
1944	7,080	2,596	9,676
1945	5,580	3,622	9,202
1946	6,567	9,669	16,236
1947	6,763	7,701	14,464
1948	5,997	7,595	13,592
1949	5,252	6,929	12,181
1950	5,454	6,755	12,209
Totals	98,840	69,304	168,144

In the sixteen year period 1935 to 1950, 168,144 medical licenses have been issued, 98,840 after written examination and 69,304 by endorsement of credentials.

Candidates Examined by Medical Examining Boards

In table 2 are recorded data referring to those examined for medical licensure in 1950 by individual states, the District of Columbia, Alaska, Hawaii, Puerto Rico and the Virgin Islands. For each there are given the numbers who passed and failed, the medical school of graduation, the percentage of failures for each school as well as each licensing board and the number of states in which graduates of a given school were examined. Medical schools in the United States which are no longer in existence, foreign faculties of medicine, unapproved medical schools and schools of osteopathy are not listed by name, but the numbers examined in these three categories are included following those for existing medical schools in the United States and Canada.

TABLE 4.—*Graduates of Medical Schools in Canada Examined for Licensure in the United States, 1950*

	Examined	Passed	Failed
Alabama	1	1	0
California	19	18	1
Delaware	2	2	0
Florida	5	3	2
Idaho	1	1	0
Illinois	10	9	1
Indiana	2	2	0
Louisiana	3	3	0
Maine	7	7	0
Maryland	7	7	0
Massachusetts	5	3	2
Michigan	1	1	0
Minnesota	9	9	0
Mississippi	1	1	0
Missouri	2	2	0
New Hampshire	3	3	0
New York	19	16	3
North Carolina	3	3	0
North Dakota	9	8	1
Ohio	5	5	0
Oklahoma	1	1	0
Pennsylvania	7	7	0
Rhode Island	2	2	0
Utah	1	1	0
Vermont	1	0	1
Virginia	3	2	1
Washington	8	8	0
Wisconsin	4	4	0
Totals	141	129	12

Throughout the last calendar year 6,203 were examined, of whom 5,481 passed and 722 failed. The candidates represented graduates of seventy-one of the seventy-two approved medical schools of the United States, nine approved medical schools of Canada, five medical schools in the United States no longer in operation, 139 faculties of medicine and five licensing corporations of other countries, five unapproved medical schools in the United States and seven schools of osteopathy. Osteopaths who were granted the legal right to practice medicine, surgery, or both, by the medical examining boards are included in these statistics. Osteopaths in other states who were granted the privilege of special practice by other than medical examining boards are excluded from these compilations.

Examination and reciprocity meetings have been scheduled at frequent intervals in recent years to facilitate licensure and to enable physicians to commence practice without undue delay. Later in this study there is included a tabulation giving the schedules for all states.

Represented among the 6,203 examinees were 4,955 graduates of approved medical schools in the United States, of whom 2.9 per cent failed; 141 graduates of approved schools in Canada with 8.5 per cent failures; 15 who were graduated from medical schools no longer operating with 6.7 per cent failures; 799 graduates of faculties of medicine located in countries other than the United States and Canada, 55 per cent of whom failed; 118 graduates of unapproved medical schools in the United States, none of which are in existence, with 62.2 per cent failures and 175 graduates of schools of osteopathy with 28 per cent failures.

TABLE 5.—*Source of Candidates Examined for Licensure in the United States, 1950*

Medical Schools	Number of Schools	Number Examined	Number Passed	Number Failed	Percentage Failed
Approved in United States	72	4,955	4,808	147	2.9
Approved in Canada	9	141	129	12	8.5
Extinct	5	15	14	1	6.7
Foreign	144	799	359	440	55.0
Unapproved Schools	5	118	45	73	62.2
Schools of Osteopathy	7	175	126	49	28.0
Totals	242	6,203	5,481	722	11.6

As in table 1, the 6,203 examinees do not represent an equal number of individuals, since a candidate tested in more than one state in a calendar year is counted in each state. However, if a candidate failed more than once in a given state within the year, he is counted in that state as a single failure. Figures which show the number of individual licentiates added to the medical profession in 1950 are given in tables 12, 13 and 14.

The greatest number of graduates of any one school examined was 177, representing the University of Illinois College of Medicine, 101 of whom were tested in Illinois and 76 in twenty-two other states. The greatest number examined from private schools was 154 representing Northwestern University Medical School who were tested in twenty-two states, sixty-six of whom were examined in Illinois where the school is located. More than 125 graduates of four other schools applied for licensure by the written examination method in the last calendar year; namely, Tulane University (140) in eleven states; Uni-

versity of Minnesota (132) in eleven states; St. Louis University (133) in twelve states and Jefferson Medical College (147) in twenty-five states. Yale University with nine examinees, Albany Medical College with nine examinees and the University of Buffalo with four represented schools with the fewest number of applicants for medical licensure by written examination before state boards. The majority of graduates of these three schools are licensed by endorsement of the certificate of the National Board of Medical Examiners. The University of Washington School of Medicine graduated its first class in 1950 but none appeared for licensure in 1950 before any state board.

Twenty-one approved schools in the United States had no failures before medical licensing boards, thirty-one less than 5 per cent and eleven between 5 and 10 per cent. There were eight schools with 10 per cent or more of failures in state examinations. The over-all figures and percentages for failures are modified by data on those who were examined by the National Board of Medical Examiners in its final examination as well as those passing state tests. (See table 6.)

Graduates of Jefferson Medical College were examined in the greatest number of states, twenty-five, Temple University alumni were tested in twenty-four states and the University of Illinois by twenty-three state boards. Three schools had graduates examined in fewer than four states.

A total of 141 graduates of nine approved medical schools in Canada appeared for licensure in the United States in 1950 in twenty-eight states. The figures are given for each licensing board by school in table 1 and by totals in table 4. Of the 141 candidates, 129 passed and 12, 8.5 per cent, failed. California and New York examined 19, Illinois 10 and all other states fewer than 10. Two Canadian medical schools had no failures before United States licensing boards. The lowest failing percentage was 4.5.

Graduates of five unapproved medical schools were examined in eleven states and Hawaii and graduates of seven schools of osteopathy were tested in ten states and the District of Columbia. Represented were 118 graduates of unapproved schools of whom 45 passed and 73, 62.2 per cent, failed and 175 osteopathic graduates, of whom 126 passed and 49, 28.0 per cent failed.

Graduates of foreign faculties of medicine were examined in thirty states, the District of Columbia, Hawaii, Puerto Rico and the Virgin Islands. There were 799 such graduates with 440, or 55 per cent, failures.

Fifteen graduates of five approved medical schools no longer in operation were tested in eight states, of whom 14 passed and one failed (6.7 per cent).

In all six categories mentioned, 6,203 candidates appeared before medical examining boards in 1950, of whom 5,481 passed and 722, or 11.6 per cent failed.

Totals for the six categories are given in table 5. It will be noted that from the existing approved medical schools in the United States there were 2.9 per cent who failed, 8.5 per cent of the graduates of Canadian schools and 6.7 of the graduates of extinct medical schools. The greatest percentage of failures represented three groups, foreign faculties of medicine, unapproved medical schools

TABLE 6.—*Consolidated Examinations, State Medical Examining Boards and the National Board of Medical Examiners, 1950*

School	Results by Medical Examining Board Tests		Part III Examination of National Board of Medical Examiners		Total Examined	Totals		Percentage Failed
	P	F	P	F		P	F	
Medical College of Alabama..	37	0	1	0	38	38	0	0.0
University of Arkansas.....	77	0	1	0	78	78	0	0.0
University of California.....	78	1	3	0	82	81	1	1.2
Coll. of Med. Evan.....	70	4	29	1	104	99	5	4.8
Univ. of Southern California	70	0	10	0	80	80	0	0.0
Stanford University.....	86	2	4	0	92	90	2	2.2
University of Colorado.....	67	0	6	0	73	73	0	0.0
Yale University.....	8	1	52	0	61	60	1	1.6
Georgetown University.....	19	1	77	1	98	96	2	2.0
George Washington Univ.....	15	2	69	0	86	84	2	2.3
Howard University.....	53	9	12	1	75	65	10	13.3
Medical Coll. of Georgia.....	97	0	1	0	98	98	0	0.0
Emory University.....	82	1	5	0	88	87	1	1.1
Chicago Medical School.....	26	1	6	0	33	32	1	3.0
Northwestern University.....	152	2	33	0	187	185	2	1.1
Stritch School of Medicine...	58	3	9	0	70	67	3	4.3
University of Chicago.....	57	0	8	0	65	65	0	0.0
University of Illinois.....	173	4	23	0	200	196	4	2.0
Indiana University.....	115	1	1	0	117	116	1	0.9
State University of Iowa.....	77	1	24	0	102	101	1	1.0
University of Kansas.....	95	0	1	0	96	96	0	0.0
University of Louisville.....	103	3	9	0	115	112	3	2.6
Louisiana State University...	79	1	0	0	80	79	1	1.2
Tulane Univ. of Louisiana....	138	2	17	0	157	155	2	1.3
Johns Hopkins University....	81	0	12	0	93	93	0	0.0
University of Maryland.....	88	2	14	0	104	102	2	1.9
Boston University.....	10	0	51	0	61	61	0	0.0
Harvard Medical School.....	43	0	122	0	165	165	0	0.0
Tufts College Medical School.	13	2	84	1	100	97	3	3.0
University of Michigan.....	112	2	26	0	140	138	2	1.4
Wayne University.....	71	0	2	0	73	73	0	0.0
University of Minnesota.....	129	3	12	0	144	141	3	2.1
St. Louis University.....	129	4	9	0	142	138	4	2.8
Washington University.....	99	0	11	0	110	110	0	0.0
Creighton University.....	58	5	15	0	78	73	5	6.4
University of Nebraska.....	79	1	10	0	90	89	1	1.1
Albany Medical College.....	6	0	37	1	44	43	1	2.3
State Univ. (Brooklyn).....	19	2	87	1	109	106	3	2.8
University of Buffalo.....	4	0	52	0	56	56	0	0.0
Columbia University.....	21	2	115	0	138	136	2	1.4
Cornell University.....	31	4	48	0	83	79	4	4.8
New York Medical College....	13	3	86	4	106	99	7	6.6
New York University.....	30	14	102	1	147	132	15	10.2
University of Rochester.....	20	0	43	0	63	63	0	0.0
State University (Syracuse)...	10	3	41	0	54	51	3	5.6
Duke University.....	15	0	52	0	67	67	0	0.0
Bowman-Gray School of Med.	38	2	1	0	41	39	2	4.9
University of Cincinnati.....	95	3	2	1	101	97	4	4.0
Western Reserve University...	102	3	8	0	113	110	3	2.7
Ohio State University.....	89	4	4	0	97	93	4	4.1
University of Oklahoma.....	84	1	2	0	87	86	1	1.1
University of Oregon.....	55	1	4	0	60	59	1	1.7
Hahnemann Medical College..	77	6	31	1	115	108	7	6.1
Jefferson Medical College.....	140	7	22	0	169	162	7	4.1
Temple University.....	94	3	29	0	126	123	3	2.4
University of Pennsylvania...	101	1	35	0	137	136	1	0.7
Woman's Medical College.....	21	1	15	0	37	36	1	2.7
University of Pittsburgh.....	64	0	7	0	71	71	0	0.0
Med. Coll. of South Carolina.	71	0	2	0	73	73	0	0.0
University of Tennessee.....	108	5	2	0	115	110	5	4.3
Meharry Medical College.....	73	7	7	0	87	80	7	8.0
Vanderbilt University.....	52	0	9	0	61	61	0	0.0
Southwestern Medical School.	58	2	2	0	62	60	2	3.2
University of Texas.....	103	1	5	0	109	108	1	0.9
Baylor University.....	82	6	1	0	89	83	6	6.7
University of Utah.....	49	0	4	0	53	53	0	0.0
University of Vermont.....	18	1	32	0	51	50	1	2.0
University of Virginia.....	74	1	1	0	76	75	1	1.3
Medical College of Virginia...	99	1	9	0	109	108	1	0.9
University of Washington....	0	0	0	0	0	0	0	0.0
University of Wisconsin.....	70	0	2	0	72	72	0	0.0
Marquette University.....	78	5	18	1	102	96	6	5.9
Subtotals: U. S. Schools...	4,808	147	1,686	14	6,655	6,494	161	2.4
University of Alberta.....	8	0	0	0	8	8	0	0.0
University of Manitoba.....	17	1	1	0	19	18	1	5.3
Dalhousie University.....	4	0	0	0	4	4	0	0.0
Queen's University.....	9	2	2	1	14	11	3	21.4
Univ. of Western Ontario....	9	1	2	0	12	11	1	8.3
University of Toronto.....	31	4	12	0	47	43	4	8.5
McGill University.....	42	2	17	1	62	59	3	4.8
University of Montreal.....	3	0	0	0	3	3	0	0.0
Laval University.....	6	2	0	0	8	6	2	25.0
Subtotals: Canadian Schools	129	12	34	2	177	163	14	7.9
Foreign Medical Faculties....	359	440	15	0	814	374	440	54.0
Extinct Medical Schools.....	14	1	1	0	16	15	1	6.7
Unapproved Schools.....	45	73	0	0	118	45	73	62.2
Schools of Osteopathy.....	126	49	0	0	175	126	49	28.0
Totals	5,481	722*	1,736	16*	7,955	7,217	738	9.2

* Represents individuals failed.

and schools of osteopathy. In these groups, 55, 62.2 and 28 per cent, respectively, failed. Those registered in these three groups are separately discussed later in an analysis of these statistics.

Elsewhere (see tables 12, 13 and 14, pages 356 and 357) are given figures referring to actual licentiates and additions to the medical profession.

TABLE 7.—*Licensure Failures by Graduates of Existing Approved Schools in the United States Located in the State Where Examined and Elsewhere, 1950*

States with Four Year Medical Schools	Total No. Examined	No. Failures of Schools in State	No. Schools in State Represented at Examinations	Per Cent Failed	No. Failures of Schools Out of State	No. Schools Out of State Represented at Examinations	Per Cent Failed	Per Cent Failed in All U. S. Schools
Alabama	39	0	1	0.0	0	6	0.0	0.0
Arkansas	74	0	1	0.0	0	3	0.0	0.0
California	580	6	4	1.0	8	52	1.3	2.4
Colorado	76	0	1	0.0	0	9	0.0	0.0
Connecticut	48	1	1	2.1	4	16	8.3	10.4
Dist. of Columbia	27	1	3	3.7	0	3	0.0	3.7
Georgia	148	0	2	0.0	1	7	4.7	4.7
Illinois	456	2	5	0.4	3	40	0.6	1.0
Indiana	115	1	1	0.9	0	10	0.0	0.9
Iowa	87	1	1	1.1	0	10	0.0	1.1
Kansas	97	0	1	0.0	0	10	0.0	0.0
Kentucky	88	0	1	0.0	0	8	0.0	0.0
Louisiana	191	1	2	0.5	0	21	0.0	0.5
Maryland	193	1	2	0.5	1	17	0.5	1.0
Massachusetts	97	0	3	0.0	2	10	2.1	2.1
Michigan	195	0	2	0.0	0	23	0.0	0.0
Minnesota	201	0	1	0.0	0	35	0.0	0.0
Missouri	206	0	2	0.0	0	9	0.0	0.0
Nebraska	99	1	2	1.0	0	4	0.0	1.0
New York	687	22	8	3.2	40	29	5.8	9.0
North Carolina	98	0	2	0.0	0	15	0.0	0.0
Ohio	345	3	3	0.8	0	21	0.0	0.8
Oklahoma	82	0	1	0.0	0	4	0.0	0.0
Oregon	40	1	1	2.5	1	10	2.5	5.0
Pennsylvania	328	0	6	0.0	0	31	0.0	0.0
South Carolina	59	0	1	0.0	0	3	0.0	0.0
Tennessee	142	0	3	0.0	0	6	0.0	0.0
Texas	263	7	3	2.3	1	19	0.2	2.7
Utah	29	0	1	0.0	0	5	0.0	0.0
Vermont	16	0	1	0.0	0	2	0.0	0.0
Virginia	139	0	2	0.0	0	3	0.0	0.0
Washington	60	0	1	0.0	0	18	0.0	0.0
Wisconsin	130	0	2	0.0	0	26	0.0	0.0
Subtotals	5,468	48	70	0.8	61	467	1.1	1.9
States Without Four Year Medical Schools								
Arizona	9				1	9	11.1	
Delaware	23				0	15	0.0	
Florida	371				29	59	7.8	
Idaho	1				0	0	0.0	
Maine	20				0	8	0.0	
Mississippi	65				0	22	0.0	
Montana	5				0	4	0.0	
Nevada	0				0	0	0.0	
New Hampshire	7				0	3	0.0	
New Jersey	52				2	15	3.8	
New Mexico	2				0	2	0.0	
North Dakota	38				0	14	0.0	
Rhode Island	15				2	9	13.3	
South Dakota	20				0	8	0.0	
West Virginia	42				0	23	0.0	
Wyoming	2				0	2	0.0	
Alaska, Hawaii, Puerto Rico and Virgin Islands	63				4	34	6.3	
Subtotals	735				38	227	5.1	

Consolidated Examinations

A combination of the results of individual schools for two groups—those appearing for the state medical board examinations and for part III of the examinations of the National Board of Medical Examiners is given in table 6. This table probably represents a more accurate anaylsis of the performance of physicians from the individual schools in licensing examinations than is given in tables thus far presented. In some instances, it will be noted, schools having a high percentage of failures before state licensing boards had few, if any, failures before the National Board. In 1950 there were 4,808 graduates of approved medical schools in the United States examined by state boards of whom 147, 2.9 per cent failed. In the same calendar year, 1,686 graduates of these institutions appeared for part III of the examinations of the National Board of Medical Examiners of whom 14, or 0.8 per cent failed. Only one graduate of any approved school failed in more than one state in 1950. In the consolidated figures the failures from approved medical schools in the United States were reduced from 2.9 per cent to 2.4 per cent.

Of the Canadian graduates, 8.5 per cent failed state board tests and 7.9 per cent failed the combined tests. Only 15 graduates of foreign medical schools were tested by the National Board. There is no comparison to be made of this group. There was only one candidate in the extinct medical school classification examined by the National Board. The National Board does not admit to its examinations the graduates of unapproved medical schools in the United States or schools of osteopathy. Only 15 graduates of foreign medical faculties were admitted to the National Board's final examination while 799 were examined by state licensing boards.

As mentioned in the previous section, the total of all examined before medical licensing boards in the United States in 1950 was 6,203, of whom 5,481 passed and 722, or 11.6 per cent failed. For both groups—state boards and the National Board—7,955 were examined; 7,217 passed and 738, or 9.2 per cent, failed. The total percentage of failures was reduced less than 3.0 per cent because of the high percentage of failures before state boards by graduates of unapproved medical schools, schools of osteopathy and foreign medical graduates. Of the failures among approved medical schools before state boards, 94 were graduates within the last five years and 66 were graduates before 1946.

Failures in Medical Licensure Examinations

Data recorded in table 7 refer to failures before medical examining boards by licentiates of 1950. In presenting these statistics the United States is divided into two groups—the thirty-two states and the District of Columbia in which approved four year medical schools are located and those states and the territories and outlying possessions which have no medical schools within their boundaries. The figures include the total number examined, the number of licentiates who failed state board examinations prior to licensure and were graduates of a medical school located in the state in which they were examined and also the number of graduates licensed in a given state who obtained their professional training in schools in other states.

Practically all states require the applicant to receive a general average of 75 per cent in the medical license examination and at least 50 per cent in any one subject. In case of failure in not more than two subjects the applicant is permitted a second examination in those subjects within twelve months. A few states consider such persons as conditioned in the subjects in which they fail and do not report them to the office of the Council on Medical Examination and Hospitals as failures. These examinees are

not included in any of the tabulations which include failures. When their grades are raised after a successful reexamination they are recorded among those who passed.

Of the 6,203 examined for licensure in 1950, there were 48 physicians who failed examinations in the state in which they obtained their professional training. This occurred in thirteen states. Twenty-two failed in New York. There were failures reported by nine states among physicians who graduated from approved medical schools located in states other than the one in which they were licensed. Again, New York had the greatest number 40. Eighteen states had no failures in either group, seven states had failures in both groups.

In the sixteen states and the territories and outlying possessions which do not have medical schools, five boards reported failures. In all, 38 failed.

The total examined in the first group, states in which approved medical schools are located, was 5,468 while in the second group, states which have no approved four year medical school within their boundary, 735 were examined.

In table 8 the figures pertaining to failures before medical licensing boards are subdivided by the number of candidates who were licensed after previous failures. The figures are presented for four categories—approved medical schools in the United States and Canada, foreign faculties of medicine, unapproved medical schools and schools of osteopathy. These groups are classified according to the number licensed after failing a state board examination once and after two or more failures. The table further indicates whether the single and multiple failures have been in the state where licensed or elsewhere. The total number of candidates licensed after examination or by endorsement of credentials is shown and also the total number of failures in all groups.

There were 12,209 licenses to practice medicine issued during the calendar year 1950. There were 385 physicians represented in the 12,209 licenses issued who had

TABLE 8.—*Failures Before Medical Licensing Boards by Licentiates, 1950*

	Licenses Issued by Examination, Reciprocity or Endorsement	Approved Schools					Foreign Schools					Unapproved Medical Schools					Schools of Osteopathy					Total Failures by Licentiates, 1950
		Licensed After One Failure		Licensed After Two or More Failures			Licensed After One Failure		Licensed After Two or More Failures			Licensed After One Failure		Licensed After Two or More Failures			Licensed After One Failure		Licensed After Two or More Failures			
		Failed in State Where Licensed	Elsewhere	Failed in State Where Licensed	Elsewhere	Failed in State Where Licensed and Elsewhere	Failed in State Where Licensed	Elsewhere	Failed in State Where Licensed	Elsewhere	Failed in State Where Licensed and Elsewhere	Failed in State Where Licensed	Elsewhere	Failed in State Where Licensed	Elsewhere	Failed in State Where Licensed and Elsewhere	Failed in State Where Licensed	Elsewhere	Failed in State Where Licensed	Elsewhere	Failed in State Where Licensed and Elsewhere	
Alabama	128	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1
Arizona	58	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0
Arkansas	116	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1
California	1,356	9	14	2	1	..	2	..	8	..	1	..	..	..	..	..	..	..	..	..	..	37
Colorado	155	..	1	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2
Connecticut	240	1	1	..	..	..	..	2	1	2	1	..	..	..	..	..	..	..	..	..	..	8
Delaware	30	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1
District of Columbia	178	..	1	..	1	..	..	2	..	4	..	..	..	..	..	..	..	..	..	..	..	8
Florida	332	3	2	1	2	1	1	1	..	..	..	1	..	1	..	2	..	..	..	..	..	15
Georgia	225	2	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	3
Idaho	56	..	3	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	3
Illinois	645	4	2	..	..	..	6	10	..	..	3	..	..	..	..	..	..	1	..	..	..	25
Indiana	246	..	1	..	..	..	..	2	..	..	..	..	..	..	..	..	..	..	..	..	..	2
Iowa	185	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	1
Kansas	159	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1
Kentucky	164	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0
Louisiana	273	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1
Maine	74	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	10
Maryland	323	..	..	..	1	..	2	2	..	1	4	..	..	4	..	..	..	..	..	..	..	8
Massachusetts	305	..	3	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1
Michigan	420	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2
Minnesota	348	..	1	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	0
Mississippi	132	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	4
Missouri	350	..	3	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	0
Montana	40	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	7
Nebraska	129	4	2	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	1
Nevada	19	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1
New Hampshire	53	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1
New Jersey	273	..	5	2	4	..	..	6	2	3	..	..	..	..	..	..	..	..	1	..	..	1
New Mexico	72	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	3	1	2	..	..	28
New York	1,161	20	1	12	..	..	36	3	45	..	4	1	..	..	..	2	6	..	1	..	..	131
North Carolina	230	..	1	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2
North Dakota	44	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0
Ohio	611	..	..	..	1	..	2	6	..	9	1	..	..	..	..	..	4	..	..	..	..	23
Oklahoma	121	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0
Oregon	95	3	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	3
Pennsylvania	587	2	5	..	1	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	2
Rhode Island	31	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1
South Carolina	104	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1
South Dakota	45	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1
Tennessee	256	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	6
Texas	752	8	5	..	1	..	1	..	..	2	..	..	..	..	..	..	2	..	3	1	..	23
Utah	78	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0
Vermont	43	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1
Virginia	266	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	1
Washington	185	..	1	..	..	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	3
West Virginia	109	..	1	..	3	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	4
Wisconsin	262	..	1	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2
Wyoming	29	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0
Alaska, Guam, Hawaii, Puerto Rico and Virgin Islands	116	1	..	..	..	..	1	1	..	..	..	..	1	..	..	1	..	..	..	..	..	5
Totals	12,209	58	61	18	22	3	51	39	56	23	16	2	1	5	0	5	15	2	6	2	0	385

previously been unsuccessful before a licensing board. From the approved schools 162 had previously failed a state board examination. Fifty-eight had one failure in the state in which they were licensed, while 61 were licensed after one failure in another state. Forty-three were licensed after more than one failure.

Ten physicians had more than 10 failures before securing licenses. One of these was a graduate of an approved medical school in the United States with thirteen failures; three were graduates of unapproved schools and schools of osteopathy, one of whom had eleven previous failures and two had thirteen failures each. Six graduates of foreign faculties of medicine had failures ranging from 10 to 17. In general, the state licensing boards impose no restrictions on the number of examinations which may be taken prior to license but most states have a set limit of three tests.

In the group of foreign medical faculties, 185 graduates were licensed after previous failure. Also, 13 graduates of unapproved medical schools and twenty graduates of schools of osteopathy were registered after previous failure.

TABLE 9.—*Reciprocity and Endorsement*

Reciprocates with, or Endorses Certificates Granted by

Marginal Number	The Examining Board of	Alabama	Arizona	Arkansas	California	Colorado	Connecticut	Delaware	Dist. of Columbia	Florida	Georgia	Idaho	Illinois	Indiana	Iowa	Kansas	Kentucky	Louisiana	Maine	Maryland	Massachusetts	Michigan	Minnesota	Mississippi	Missouri	Montana	Nebraska	Nevada	New Hampshire	New Jersey	New Mexico	Marginal Number
1	Alabama	..	..	+	+	+	..	+	+	..	+	..	+	+	+	+	+	+	+	+	..	+	+	+	+	+	+	+	..	+	+	1
2	Arizona	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2
3	Arkansas (regular board)	+	+	..	+	+	+	..	+	..	+	+	+	+	+	+	+	+	+	+	..	+	+	+	+	..	+	+	..	+	+	+	3
4	California	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	4
5	Colorado	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	5
6	Connecticut (reg. & homeo. bds.)	..	..	..	..	..	..	..	+	..	..	+	..	+	..	+	..	+	+	+	+	+	..	..	..	..	..	..	..	+	..	..	6
7	Delaware (regular board)	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	7
8	District of Columbia	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	8
9	Florida	No reciprocity or endorsement policies																													9
10	Georgia	+	..	+	+	..	..	+	..	..	..	..	+	+	+	+	+	+	+	+	..	+	+	+	+	..	+	+	+	+	+	10
11	Idaho	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	11
12	Illinois	+	..	+	+	..	..	..	..	..	..	..	..	+	+	+	+	+	+	+	..	+	..	+	+	..	+	+	..	+	+	..	12
13	Indiana	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	13
14	Iowa	+	+	+	+	+	+	+	+	+	+	+	+	+	..	+	+	+	+	+	..	+	+	+	+	+	+	+	+	+	+	+	14
15	Kansas	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	15
16	Kentucky	+	..	+	+	+	..	+	+	..	+	..	+	+	+	+	..	+	+	+	..	+	+	+	+	+	+	+	+	+	+	+	16
17	Louisiana (reg. & homeo. bds.)	+	+	+	+	+	+	+	+	..	+	..	+	+	+	+	+	..	+	+	..	+	+	+	+	+	..	+	+	+	+	+	17
18	Maine	..	..	+	+	+	..	..	..	..	+	..	..	..	..	..	..	+	..	+	..	+	+	..	+	+	+	+	..	..	+	18
19	Maryland (reg. & homeo. bds.)	+	..	+	+	..	+	+	+	..	+	+	+	+	+	+	+	+	+	..	..	+	+	..	+	+	+	+	+	+	+	+	19
20	Massachusetts	+	..	..	..	..	+	+	+	..	+	+	..	+	+	+	+	+	+	+	..	..	..	..	+	+	..	..	+	+	+	..	20
21	Michigan	+	+	+	+	+	+	+	+	..	+	+	+	+	+	+	+	+	+	+	..	+	..	..	+	+	+	+	+	+	+	+	21
22	Minnesota	+	+	+	+	+	+	+	..	..	+	+	..	+	+	+	..	+	+	+	..	+	+	..	+	+	+	+	+	+	+	+	22
23	Mississippi	+	+	+	+	+	+	+	+	..	+	..	+	+	+	+	+	+	+	+	..	+	+	+	..	+	+	+	+	+	+	+	23
24	Missouri	+	..	..	+	..	..	..	..	..	+	+	+	+	+	+	+	+	+	+	..	+	+	+	+	..	..	+	+	..	..	..	24
25	Montana	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	25
26	Nebraska	+	+	+	+	+	+	+	+	..	+	..	+	+	+	+	+	+	+	+	..	+	+	+	+	+	+	..	+	+	+	+	26
27	Nevada	+	..	+	+	+	..	..	+	..	+	+	+	+	+	+	+	+	+	+	..	+	+	+	+	+	+	+	..	+	+	..	27
28	New Hampshire	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	28
29	New Jersey	+	+	+	+	+	+	+	+	..	+	+	+	+	+	+	+	+	+	+	..	+	+	+	+	+	+	+	+	+	+	+	29
30	New Mexico	+	+	+	+	+	+	+	+	..	+	+	+	+	+	+	+	+	+	+	..	+	+	+	+	+	+	+	+	+	+	..	30
31	New York	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	31
32	North Carolina	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	32
33	North Dakota	+	..	+	+	+	..	..	+	..	+	..	+	+	+	+	+	+	+	+	..	+	..	+	+	+	+	+	+	+	+	+	33
34	Ohio	+	+	+	+	+	+	+	+	..	+	+	+	+	+	+	+	+	+	+	..	+	+	+	+	+	+	+	+	+	+	+	34
35	Oklahoma	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	35
36	Oregon	+	+	+	+	+	+	+	..	..	+	+	+	+	+	..	+	+	+	+	..	+	+	+	+	+	+	+	+	+	+	+	36
37	Pennsylvania	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	37
38	Rhode Island	..	+	+	+	+	+	+	..	..	+	+	+	+	+	+	+	..	+	+	..	+	+	+	+	+	..	+	+	+	+	..	38
39	South Carolina	+	..	..	..	..	..	+	..	..	+	..	..	+	..	+	+	+	+	+	..	+	..	+	+	..	+	..	+	..	+	+	..	39
40	South Dakota	+	..	+	+	..	..	..	..	..	+	..	..	+	+	+	+	+	..	+	..	+	+	+	+	..	+	+	..	+	..	..	+	40
41	Tennessee	+	+	+	+	+	+	+	..	..	+	..	+	+	+	+	+	+	+	+	..	+	+	+	+	+	+	+	..	+	+	+	41
42	Texas	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	42
43	Utah	+	+	+	+	+	+	+	..	..	+	+	+	+	+	+	+	+	+	+	..	+	+	+	+	+	+	+	+	+	+	+	43
44	Vermont	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	44
45	Virginia	+	..	+	+	..	..	+	+	..	+	..	+	+	+	+	+	+	+	+	..	+	+	+	+	..	+	..	..	+	+	+	45
46	Washington	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	46
47	West Virginia	+	..	+	[8]	[8]	+	+	+	..	+	..	[8]	[8]	+	+	+	+	+	+	[8]	+	+	+	+	+	+	..	+	..	+	..	47
48	Wisconsin	+	+	+	+	+	+	+	+	..	+	..	+	+	+	+	+	+	+	+	..	+	+	+	+	+	+	+	+	+	+	+	48
49	Wyoming	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	49
50	Alaska	+	..	+	+	+	+	..	+	..	..	..	+	..	+	+	+	..	+	+	..	+	+	+	+	..	..	+	+	+	+	..	50
51	Hawaii	No reciprocal relations																													51
52	Puerto Rico	..	..	..	..	..	..	..	+	..	..	..	..	..	..	..	..	..	..	..	..	+	..	+	..	..	..	+	..	..	..	..	52

This summary should be supplemented by direct communication with the

Some states have additional requirements for graduates of schools outside the United States and Canada.

+, indicates reciprocal or endorsement relationships have been established; .. indicates no reciprocal or endorsement relationships have been established. (See column—"At the discretion of the board.")

1. 1st P, first papers required; ⊕, in citizenship column indicates full citizenship required, in other columns it implies a requirement.
2. In most cases there is a small additional recording or registration fee.
3. Year of practice after internship required.
4. Internship accepted in lieu of one year's practice.
5. Professional practice required.
6. All applicants must be graduates of a medical school approved by the American Medical Association.
7. Just preceding application.
8. No basic science reciprocity—examination must be within the state.
9. Basic science certificate required either by reciprocity or examination in addition to basic science subjects of National Board.
10. Canadian citizens are required to file first papers.
11. Not applicable to citizens of Canada.
12. Oral examination required when original license is ten or more years old.
13. Applicant must have resided in the state used as basis of application for one year after date on said certificate, or show two years of licensed practice in some other state.
14. Oral examination required.
15. Graduates of foreign medical schools must have fulfilled all requirements of California prior to admittance to examination for any certificate used as basis of application in California and pass an oral, clinical and written examination.
16. Actual practice for a period of three years immediately preceding date of application.
17. Practical, clinical examination required.
18. Foreign graduates only.
19. Regular and Homeopathic boards.

Registration by Reciprocity and Endorsement

A summary of the reciprocity and endorsement policies pertaining to medical licensure in effect in the United States, Alaska, Hawaii and Puerto Rico are included in table 9. Florida is the only state which requires all applicants for licensure to pass a written examination. Hawaii does not have reciprocal relations with any state but will endorse physicians certified by the National Board of Medical Examiners. Those desiring licenses by reciprocity and endorsement in seventeen states, the District of Columbia and Alaska are required to obtain a certificate from the state board of examiners in the basic sciences before being eligible for licensure. In the section of these statistics pertaining to basic science boards there is included a table which outlines the reciprocity, endorsement, exemption or waiver policies of the boards of examiners in the basic sciences.

Policies of Medical Licensing Boards

Marginal Number	Reciprocates with, or Endorses Certificates Granted by: New York	North Carolina	North Dakota	Ohio	Oklahoma	Oregon	Pennsylvania	Rhode Island	South Carolina	South Dakota	Tennessee	Texas	Utah	Vermont	Virginia	Washington	West Virginia	Wisconsin	Wyoming	Alaska	Puerto Rico	At the Discretion of the Board	National Board of Medical Examiners	Requirements: Basic Science Certificate	Internship	Professional Practice	Citizenship [1]	Fees, Dollars [2]	Miscellaneous	Marginal Number
1	+	+	+	+	+	+	+	..	+	+	+	+	..	+	+	+	+	+	+	+	..	+	+	..	..	1[4]	⊕[11]	50	..	1
2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+	+	⊕[6]	⊕	3[4,7]	1st P	100	42	2
3	+	+	+	+	+	+	+	+	+	+	+	+	..	+	+	..	+	+	+	+	..	..	+[9]	⊕	⊕	1[4]	⊕	50[22]	42	3
4	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+	+	⊕	⊕	1[13]	⊕[21]	100	42,35	4
5	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+[43]	+[9]	⊕	⊕	1[4]	⊕	50	42	5
6	..	..	..	+	..	..	+	+	..	..	+	+	..	+	..	..	+	..	..	..	..	+	+[27]	⊕[19]	..	3[16]	1st P[10]	50	..	6
7	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+	+[3]	..	..	2	⊕	100	..	7
8	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+	+[27]	..	⊕	1[3]	..	50	..	8
9	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	⊕	⊕	..	⊕	..	..	9
10	..	..	+	+	+	+	+	..	+	+	+	+	+	+	+	+	+	+	+	..	..	..	+	⊕	⊕	0	⊕	50	..	10
11	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+	+	..	⊕	..	⊕	100	..	11
12	..	+	+	+	+	+	+	+	..	..	+	+	+	+	+	+	+	+	+	+	..	..	+[17]	..	..	1	1st P	25	37,42	12
13	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+	+	..	..	1[4]	..	50	..	13
14	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	..	..	..	+	⊕	⊕	1[4]	⊕[11]	50	..	14
15	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+	+	..	⊕	1[4,7]	⊕	50	42	15
16	..	..	+	+	+	..	+	..	+	+	+	+	+	+	+	+	+	+	..	..	..	..	+	..	⊕	1[4]	⊕	50	42	16
17	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	..	..	..	+[25]	..	88	1[4]	1st P[10,10]	50[22]	42	17
18	..	..	+	..	..	..	+	..	+	..	+	+	+	+	+	+	+	+	+	..	..	..	+[14]	..	..	1[4]	⊕[11]	50	..	18
19	+	+	..	+	+	+	+	..	+	..	+	+	..	+	+	+	+	+	..	+	..	+	+	..	..	1[4]	1st P	50	42	19
20	+[44]	+	..	+	+	+	+	..	+	..	+	+	..	+	+	+	+	+	..	+	..	+	+	..	..	0	1st P	50[28]	..	20
21	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+[35]	⊕[37]	⊕	1[4]	..	50	34	21
22	+	+	..	+	+	+	+	..	+	+	+	+	+	+	+	+	+	+	+	..	..	+	+	..	..	0	1st P	75	37,42	22
23	+	+	..	+	+	+	+	..	+	+	+	+	+	+	+	+	+	+	+	..	..	+	+	..	..	..	⊕[11]	50	42,11	23
24	..	..	+	+	..	..	..	..	..	..	+	..	+	..	..	+	+	+	..	+	..	+	+[39]	..	⊕[33]	1[4]	⊕	50	..	24
25	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+	..	..	..	1[4]	⊕	75	42	25
26	+	+	+	+	+	+	+	..	+	+	+	+	+	+	+	+	+	+	+	+	..	..	+[36]	⊕	..	1[4]	⊕	50	..	26
27	+	..	+	+	+	+	+	..	+	+	+	+	+	+	+	+	+	+	+	+	..	..	+	..	⊕	1[4]	⊕	200	14,42	27
28	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+	+	..	..	0	⊕[11]	50	..	28
29	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	..	+	+	..	⊕	0	⊕	100	..	29
30	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	⊕	..	1[4]	1st P	50	..	30
31	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+	+	..	..	2	1st P	25	..	31
32	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+	+	..	..	0	..	50	42,6	32
33	..	+	..	+	+	+	+	..	..	+	..	+	+	+	+	+	+	+	+	+	..	+	+	..	⊕	1	⊕	50[22]	14,42	33
34	+	+	+	..	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	..	+	+	..	..	1[4]	1st P	50	..	34
35	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+	+	⊕[32]	⊕	1[4]	⊕	100	42,11,6	35
36	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	..	+[29,28]	+[9,27]	⊕	⊕	1[4]	⊕	100	..	36
37	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+	+	..	..	2[24]	1st P	50	42	37
38	..	+	..	+	+	..	+	..	..	..	+	..	+	..	+	+	+	+	+	..	..	+[14]	+[14]	⊕	⊕	0	1st P	20	14	38
39	..	..	..	+	+	+	+	..	..	..	+	..	+	..	+	+	+	+	+	..	+	..	+	+[14]	⊕	⊕	1[4]	⊕	50	42	39
40	..	+	+	+	+	+	..	..	+	..	+	..	+	+	+	+	+	+	+	..	..	..	+	⊕	⊕	1	1st P	50	..	40
41	+	+	..	+	..	+	..	+	+	..	+	+	..	+	+	+	+	+	+	..	..	..	+[30]	..	⊕	0	⊕	50	42	41
42	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+	+	⊕	⊕	0	..	50	..	42
43	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	..	..	+	+	..	⊕	3[1]	⊕	50	42	43
44	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+	+[38]	..	⊕	1[2]	⊕	50	..	44
45	..	+	..	+	..	+	..	+	+	+	+	..	+	..	+	+	+	..	..	..	..	+	+	⊕[18]	⊕	2[26]	1st P[11]	50	..	45
46	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+	+[8]	⊕[8]	⊕	0	..	25	..	46
47	..	+	+	+	+	+	[38]	+	+	+	+	+	+	+	..	..	+	+	+	..	..	..	+	..	⊕	0	⊕	100	..	47
48	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	..	+	..	+	+	+[14]	..	⊕	⊕	1[29]	1st P	50[22]	..	48
49	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+[14]	+[14]	⊕	⊕	0	⊕	50	..	49
50	..	+	+	+	+	+	..	..	..	..	+	+	+	+	+	+	+	+	..	..	..	..	+	⊕	⊕	0	⊕	100	6	50
51	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	⊕	⊕	..	⊕	25	42,6	51
52	+	..	+	..	..	..	+	..	+	..	..	..	..	..	..	..	..	+	..	..	..	+[9]	+	..	⊕	1[3]	⊕	30	..	52

secretary of the licensing board of the state in which the physician is interested.

20. Reciprocity is extended to all states which accept Oregon licentiates on reciprocity basis.
21. Not required if country in which applicant is licensed will admit to practice citizens of the United States licensed to practice in some state or on proof of requirements similar to those required by California for graduates of foreign medical schools.
22. Fee same as applicant's state charges if more than $50.
23. Oral examination required if applicant's state requires it.
24. If the applicant passes the examination in the state from which he transfers after the completion of his internship, no practice is required.
25. License in state with which Louisiana reciprocates required.
26. Internship accepted—considered equivalent to two years' practice.
27. Fee, $25.
28. Fee for license on basis of National Board certificate, $25.
29. A two year internship is accepted.
30. Diplomates of National Board not required to have been in practice for three years.
31. Same as required of candidates of state applying for licensure.
32. Not required for licensure by reciprocity.
33. Reciprocity applicants only.
34. Supplemental examination required in certain cases when accepting the examination of a state with whom reciprocal relations have not been established.
35. May be licensed after a special (written) supplemental examination.
36. Fee $50.
37. For matriculants after Oct. 15, 1937.
38. Licentiates of California, Colorado, Indiana, Iowa, Massachusetts and Rhode Island accepted on reciprocal basis at discretion of board.
39. Fee, $15.
40. Permanent license withheld until completion of citizenship.
41. Graduates of foreign medical schools effective Sept. 15, 1935. Canadian schools exempted effective Sept. 19, 1939.
42. Graduates of foreign medical schools are not accepted.
43. Reciprocity extended at discretion of board to states having comparable licensing requirements and which accept Colorado applicants on a substantially equal reciprocal basis.
44. If registered after July 1, 1945.

Thirty states, Alaska and Puerto Rico have definite reciprocal agreements with specific states. Thirty-five boards including nineteen which have specific reciprocity agreements, are given discretionary powers under the medical practice acts. These boards will register physi-

TABLE 10.—*Candidates Licensed by Reciprocity and Endorsement of Credentials, 1950*

Source of Former License or Credentials

Marginal Number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55
States Issuing Licenses by Reciprocity or Endorsement	Total Licensed	Alabama	Arizona	Arkansas	California	Colorado	Connecticut	Delaware	Dist. of Columbia	Florida	Georgia	Idaho	Illinois	Indiana	Iowa	Kansas	Kentucky	Louisiana	Maine	Maryland	Massachusetts	Michigan	Minnesota	Mississippi	Missouri	Montana	Nebraska	Nevada	New Hampshire	New Jersey	New Mexico	New York	North Carolina	North Dakota	Ohio	Oklahoma	Oregon	Pennsylvania	Rhode Island	South Carolina	South Dakota	Tennessee	Texas	Utah	Vermont	Virginia	Washington	West Virginia	Wisconsin	Wyoming	U. S. Govt. Services	National Board of Medical Examiners	Alaska, Guam, Hawaii, Puerto Rico and Virgin Islands	Canadian, Foreign	Special Exemption
Alabama	92	..	..	2	..	..	..	..	..	..	12	..	6	1	..	..	1	11	..	2	..	3	..	1	7	..	1	..	..	2	..	4	1	..	1	..	..	6	..	4	..	19	1	..	..	1	..	..	..	..	..	6	..	..	.
Arizona	50	..	..	..	2	1	..	1	..	..	..	..	4	..	1	..	1	..	..	2	1	7	6	..	2	..	1	..	..	1	..	1	1	..	3	..	..	3	..	..	..	..	2	..	..	2	1	..	..	..	..	7	..	..	..
Arkansas	42	..	..	..	3	2	..	..	..	..	1	..	2	..	..	..	1	2	..	1	..	2	1	..	3	..	1	..	..	..	..	..	3	..	..	3	1	1	..	..	..	..	6	3	..	..	2	..	..	..	..	3	..	1	..
California	837	2	..	7	..	7	4	..	1	3	1	2	101	14	17	18	10	12	2	10	4	36	39	2	22	1	12	1	1	6	1	43	3	2	42	10	9	38	2	2	2	15	14	10	2	7	6	1	19	..	39	229	6	..	..
Colorado	79	..	..	1	2	..	2	..	..	..	..	..	9	2	3	4	..	1	2	1	..	3	4	1	3	..	10	..	..	..	..	..	..	..	1	2	..	2	..	..	..	1	..	..	..	1	1	..	2	..	..	20	1	..	..
Connecticut	216	2	..	2	1	..	..	..	..	..	..	..	3	4	2	..	..	3	2	5	3	4	..	..	..	..	2	..	1	4	..	26	1	..	5	..	..	5	1	..	..	1	1	..	2	2	..	1	..	..	..	133	..	..	..
Delaware	7	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	1	..	..	..	..	..	..	..	1	..	..	..	..	..	1	..	..	2	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..
Dist. of Columbia	154	1	..	..	2	..	1	1	..	..	3	..	3	..	..	..	..	3	1	19	2	1	..	..	3	..	1	..	..	2	..	6	4	..	5	..	..	13	..	..	..	4	2	..	..	12	..	1	..	..	..	63	..	..	1
Florida	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Georgia	78	2	..	..	2	..	..	..	1	..	..	..	2	..	1	..	5	6	..	7	..	1	2	1	4	..	..	..	..	..	..	7	..	2	..	..	4	..	5	..	7	..	..	2	6	..	..	..	..	..	11	..	..	..
Idaho	54	..	..	..	5	6	..	..	..	..	..	..	2	..	1	2	..	..	..	..	..	..	4	1	2	..	3	..	..	..	..	1	..	..	1	1	2	1	..	..	..	1	3	3	..	..	1	..	1	..	..	13	..	..	..
Illinois	251	2	..	2	11	2	..	..	2	..	..	..	..	13	5	1	3	5	1	4	..	6	1	..	16	..	4	1	..	..	..	..	1	..	19	1	1	15	..	..	..	2	3	1	..	..	..	1	16	..	8	104	..	..	..
Indiana	134	..	..	..	1	1	..	..	..	..	..	..	26	..	4	3	13	..	..	5	..	5	1	..	5	..	..	..	..	..	..	..	1	1	20	1	1	6	..	1	..	5	2	..	..	2	..	..	4	..	..	26	..	..	..
Iowa	124	1	..	1	5	2	..	..	1	..	1	..	14	1	..	1	4	2	..	4	..	1	5	2	4	..	12	..	..	..	..	3	..	..	7	2	1	3	..	1	1	3	3	1	..	..	1	1	3	..	..	33	..	..	..
Kansas	63	..	..	1	1	..	..	1	..	..	1	..	2	3	..	..	2	3	1	1	..	2	..	1	8	..	4	..	..	..	..	..	..	..	2	..	5	..	..	..	..	2	1	..	3	..	..	5	..	..	14	..	..	..
Kentucky	75	..	..	..	1	..	..	..	..	..	1	..	2	4	1	1	..	..	..	2	..	..	2	1	3	..	1	..	..	..	..	2	2	..	10	..	1	6	..	2	..	16	..	..	..	4	..	1	..	..	..	12	..	..	..
Louisiana	84	..	..	5	1	1	3	..	2	..	1	..	3	2	..	2	3	..	..	1	2	3	1	4	1	1	..	..	..	1	..	10	5	..	4	2	..	3	..	..	..	9	6	..	..	6	..	..	2	..	..	..	..	..	..
Maine	55	..	..	..	1	..	1	..	1	..	..	..	2	..	..	..	..	..	..	2	..	..	..	..	1	..	1	..	..	3	..	..	..	1	..	..	..	5	..	..	..	..	..	..	3	2	..	..	..	..	..	32	..	..	..
Maryland	133	..	..	..	9	2	1	..	8	..	1	..	5	2	1	1	1	3	1	..	..	3	..	..	3	..	..	..	..	1	..	6	1	..	1	..	..	14	..	1	..	1	..	..	1	8	..	1	..	..	..	57	..	..	..
Massachusetts	265	1	..	..	..	..	2	1	..	..	1	..	..	..	..	1	2	1	..	15	..	..	..	..	2	..	..	..	2	3	..	16	..	..	8	1	..	9	5	..	..	2	..	..	2	3	..	..	2	..	..	186	..	..	..
Michigan	264	..	..	4	8	6	1	..	1	..	1	..	22	9	6	3	3	4	..	7	3	..	9	..	17	..	7	..	..	3	..	6	5	1	21	3	2	23	..	..	..	6	9	3	..	6	3	..	9	..	..	53	..	..	..
Minnesota	147	..	2	1	6	2	..	..	..	..	1	..	..	..	3	..	3	2	..	..	..	1	..	2	5	1	9	..	..	..	..	3	1	..	2	5	2	2	..	..	3	1	4	1	..	2	..	..	3	..	..	80	..	..	..
Mississippi	69	1	..	3	1	..	..	..	..	..	2	..	2	1	..	..	3	16	..	1	..	3	..	..	1	..	..	..	..	..	..	5	..	..	1	..	..	..	..	3	..	12	..	..	..	..	..	..	..	..	..	7	..	7	..
Missouri	148	..	1	8	5	..	..	..	..	..	1	..	16	4	1	35	5	4	1	1	1	..	3	1	..	..	4	..	..	..	..	1	..	..	3	2	..	4	..	..	1	12	5	..	..	..	1	1	7	..	..	20	..	..	..
Montana	35	..	1	..	3	4	..	..	..	..	..	1	3	..	..	1	..	1	..	1	..	2	2	..	3	..	4	..	..	..	..	..	..	..	3	..	3	..	1	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..
Nebraska	33	..	..	..	3	4	..	..	..	..	..	..	2	..	4	2	1	..	..	..	..	..	3	..	..	..	..	..	..	..	..	3	..	..	..	..	..	1	..	1	1	..	..	1	..	..	..	..	..	..	..	..	7	..	..	..
Nevada	19	..	..	..	5	..	..	..	1	..	..	..	..	1	..	..	1	..	..	..	..	1	..	1	..	..	..	..	..	1	..	2	..	..	..	..	..	..	..	..	..	..	..	2	..	..	..	..	..	..	..	4	..	..	..
New Hampshire	47	..	..	..	..	3	..	..	..	..	..	..	..	..	1	..	..	..	3	1	8	..	..	1	..	..	..	..	..	..	1	2	..	..	1	..	..	1	..	..	..	..	..	..	1	..	..	..	..	..	..	22	..	2	..
New Jersey	232	..	..	..	3	2	..	2	..	..	2	..	2	..	..	..	1	3	1	9	1	6	2	..	2	..	1	..	..	..	..	40	2	..	4	..	..	39	..	..	..	3	1	..	1	4	..	..	..	..	..	101	..	..	..
New Mexico	70	..	..	..	4	5	..	..	..	..	..	..	8	2	2	2	..	1	..	2	1	..	3	1	3	..	..	..	..	..	..	6	1	..	4	2	..	3	..	..	..	1	6	..	..	..	..	..	1	..	..	12	..	..	..
New York	871	..	..	..	15	4	1	1	2	..	1	..	4	3	..	..	2	10	..	21	5	15	7	..	2	..	3	..	..	7	..	..	4	1	7	..	..	36	..	..	..	8	6	..	5	15	..	2	8	..	..	642	11	..	23
North Carolina	133	2	..	1	1	..	..	..	1	..	4	..	6	..	..	..	4	8	..	8	..	2	4	..	..	..	2	..	..	..	..	7	..	..	6	2	..	9	..	6	..	10	..	1	..	11	..	3	2	..	..	33	..	..	..
North Dakota	9	..	..	..	2	..	..	..	..	..	..	..	3	..	..	..	1	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	..	..	..
Ohio	297	..	..	2	7	1	1	..	..	1	3	..	17	9	3	2	14	5	..	9	5	17	9	..	24	..	1	..	2	4	..	26	3	1	..	..	..	26	..	2	..	7	2	..	..	9	2	3	4	..	..	75	1	..	..
Oklahoma	63	1	..	5	2	..	..	..	..	..	..	..	4	..	1	3	..	3	1	1	..	..	2	1	8	..	2	..	..	1	..	..	..	..	1	..	..	3	..	3	..	5	7	..	..	2	..	..	2	..	..	5	..	..	..
Oregon	57	..	..	..	5	1	..	..	..	..	..	..	5	..	1	..	..	..	..	1	..	4	8	..	1	..	3	..	..	..	..	..	..	..	1	..	..	1	..	..	..	1	1	..	..	..	2	..	5	..	..	17	..	..	..
Pennsylvania	262	1	..	..	3	..	1	1	..	1	1	..	8	2	..	3	1	4	2	15	..	9	3	..	5	..	1	..	..	13	..	14	3	..	10	..	..	..	1	3	..	5	2	3	1	2	..	2	4	..	1	135	2	..	..
Rhode Island	19	..	..	2	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	14	..	..	..
South Carolina	45	2	..	..	..	..	..	..	1	..	8	..	..	2	..	1	2	4	..	2	..	..	1	..	..	..	..	..	..	..	..	..	3	..	2	..	..	2	..	..	..	5	..	..	..	3	..	1	..	..	..	6	..	..	..
South Dakota	25	..	..	..	1	..	..	..	..	..	..	..	..	..	4	1	1	..	..	..	..	3	2	..	..	..	2	..	..	..	..	..	1	2	..	1	..	..	..	..	..	..	..	1	..	..	..	1	..	2	..	..	3	..	..	..
Tennessee	81	..	..	4	2	1	..	..	1	..	5	..	2	..	..	..	3	2	..	..	..	1	2	5	1	..	..	..	..	..	..	4	6	..	2	..	..	7	..	4	..	..	1	..	..	11	..	1	2	..	..	14	..	..	..
Texas	421	1	2	28	11	3	..	..	1	..	7	..	27	10	9	5	8	47	1	7	..	10	15	8	22	..	4	1	..	4	1	26	9	..	16	12	2	14	1	3	..	19	..	1	1	7	1	1	9	..	3	63	1	..	..
Utah	48	..	..	..	5	..	..	2	..	..	..	..	3	..	1	1	1	1	..	1	..	..	3	..	4	..	..	..	..	..	..	3	..	..	2	1	..	3	..	..	..	..	2	..	..	2	..	..	..	..	..	2	11	..	..	..
Vermont	30	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	2	..	..	..	..	..	..	..	..	..	..	5	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	20	..	..	..
Virginia	128	1	..	2	3	..	..	..	11	..	4	..	4	2	..	..	3	1	..	11	1	1	1	..	3	..	1	..	..	..	..	8	8	..	3	1	..	8	..	1	..	10	..	..	..	1	..	4	1	..	6	28	..	..	..
Washington	125	..	..	..	19	5	..	..	..	..	..	..	1	2	..	1	2	..	..	3	..	2	10	..	14	..	13	..	..	..	..	..	..	..	4	1	10	2	..	..	..	3	..	..	..	1	..	..	2	..	..	28	..	..	..
West Virginia	67	..	..	..	..	1	..	..	1	..	..	..	3	2	1	..	3	1	..	4	..	1	1	1	2	..	3	..	..	..	..	..	..	..	4	..	..	14	..	..	..	3	..	..	1	13	..	..	1	..	..	7	..	..	..
Wisconsin	132	..	..	..	3	1	..	..	..	..	..	..	14	..	1	..	..	2	..	..	..	5	7	..	1	..	2	..	..	1	..	2	..	1	5	..	..	1	..	..	..	..	..	..	1	..	1	..	..	..	82	...	2	..	..
Wyoming	27	..	..	..	..	3	..	..	..	..	..	..	2	1	1	..	1	..	..	..	..	3	1	..	2	..	4	..	..	..	..	..	..	..	1	1	..	..	..	..	..	..	..	..	1	..	..	..	2	..	..	4	..	..	..
Alaska, Hawaii, Puerto Rico and Virgin Islands	58	..	..	..	3	..	..	..	..	..	..	..	..	1	..	..	1	..	..	2	..	2	..	..	1	..	..	..	..	..	..	2	..	..	1	1	..	..	..	..	..	..	..	..	..	1	..	3	..	..	..	..	32	1	..	7
Totals	6,755	20	6	81	168	67	22	10	36	5	63	3	343	96	77	93	109	175	19	191	40	166	164	35	211	3	119	3	6	59	2	283	76	10	236	56	40	334	12	42	9	203	88	30	24	150	24	26	118	0	141	2,395	25	10	31
Marginal Number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55

cians who present credentials which correspond with those required by their respective states in the year issued.

The states in which physicians certified by the National Board of Medical Examiners are accepted for licensure on the basis of the board's certificate are also indicated. All states but Florida, Montana, Texas and Wisconsin accept the National Board's certificate.

Additional requisites, such as professional practice, citizenship regulations, oral examination and internship are recorded, as is also the fee for a license without written examination. In some states physicians of Canadian birth are exempt from the citizenship requirement. This is indicated by a footnote. Few states will accept graduates of foreign faculties of medicine on a reciprocal basis. Other requirements or exemptions are indicated by footnotes.

This chart will be available in reprint form. It has proved to be of material assistance to physicians contemplating locating in another state. The data recorded are intended to be merely a summary of licensure policies. A physician using this chart for reciprocal purposes should supplement the information contained therein by direct communication with the executive officer of the licensing board of the state in which he is interested. A list of the executive officers in charge of medical licensure appears elsewhere in this study.

Table 20 (page 360) contains a schedule indicating when the boards will issue licenses by reciprocity.

In table 10 are presented data pertaining to the credentials accepted as the basis for licenses granted without written examination in 1950. There were 6,755 so registered on the basis of licenses issued by other states, the District of Columbia, the territories or outlying possessions, foreign countries, government services, the certificate of the National Board of Medical Examiners and special exemption. The number of licenses issued by this method again exceeded any pre-war year, although it was 174 fewer than the number so licensed in 1949. The greatest number of licenses were issued by this method in New York where 871 were registered. California issued 837 and Texas 421. Seven other states endorsed more than 200 candidates, namely Connecticut 216, Illinois 251, Massachusetts 265, Michigan 264, New Jersey 232, Ohio 297 and Pennsylvania 262. The largest number of candidates presenting the same type of credentials were the 2,395 physicians certified by the National Board of Medical Examiners. Of these 642 were certified in New York.

There were 343 licenses issued in Illinois and 334 in Pennsylvania presented to other states for endorsement purposes. No physician holding a New Mexico license applied for registration in another state during the year, only 2 from New Mexico and three each from Montana and Nevada.

One hundred and forty-one medical officers of one of the federal services received licenses by endorsement of their military credentials in seven states. Twenty-five physicians were licensed by eight boards on the basis of a license issued in one of the territories or outlying possessions, 10 on the basis of Canadian or foreign licenses and 31 by special exemption.

In table 11 are recorded the numbers from individual schools represented by the 6,755 reciprocity licentiates. The University of Washington School of Medicine graduated its first class in June 1950 but no graduate applied for licensure either by examination or by reciprocity in 1950. All other approved medical schools in the United States and Canada had graduates licensed without written examination last year. More than 200 graduates of four schools secured such licensure. This table reflects the movement of physicians to states other than the one in which they obtained their professional training.

One hundred and thirty-four graduates of foreign medical schools obtained endorsement of state licenses in 22 states and in Guam, and 83 graduates of schools no longer in operation were registered by 28 boards. Thirteen graduates of unapproved medical schools were licensed in six states and 25 graduates of schools of osteopathy were registered in nine states to practice medicine, surgery or both.

Licentiates Representing Additions to the Medical Profession

Licentiates of 1950 who received their first license to practice medicine and surgery during the calendar year and therefore represent additions to the medical profession in the United States, Alaska, Guam, Hawaii, Puerto Rico and the Virgin Islands are shown in table 12. The figures in this table represent candidates examined in 1950 and licensed, some who were examined in previous years but whose licenses were withheld pending completion of a required internship, citizenship and other technicalities and issued in 1950 and those without a state license who were certified during the year on the basis of the examinations of the National Board of Medical Examiners. The figures also include physicians licensed on the basis of government credentials, Canadian and foreign licenses. The majority represent recent graduates.

There were 6,002 additions to the medical profession in the United States and its territories and outlying possessions. By reference to table 1 it can be noted that 12,209 licenses were issued during the year, indicating that 6,207 had previously been licensed. The number of physicians who died in 1950 was 3,794. Thus the physician population in the United States was increased by 2,208.

Analyzing table 12, it can be noted that New York had the greatest number of first licentiates, 701. California was second with 551. Four states added more than 300 to their physician population, namely Illinois, Ohio, Pennsylvania and Texas. Increases as compared with 1949 figures [1] occurred in 25 states.

The 6,002 licentiates representing additions to the medical profession in the last calendar year represented 4,609 who secured their licenses by examination and 1,393 by endorsement of credentials. The latter were mainly physicians certified by the National Board of Medical Examiners.

Increases in the physician population arranged in nine geographic divisions in the United States are shown in

1. J. A. M. A. 143: 5 (June 3) 1950.

Marginal Number	SCHOOL	Alabama	Arizona	Arkansas	California	Colorado	Connecticut	Delaware	Dist. of Columbia	Florida	Georgia	Idaho	Illinois	Indiana	Iowa	Kansas	Kentucky	Louisiana	Maine
	Marginal Number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
	ALABAMA																		
1	Medical College of Alabama, Birmingham	1	..	..	..	..	..	..	..	..	1	..	..	..	1	..	..	..	..
	ARKANSAS																		
2	University of Arkansas School of Medicine, Little Rock	2	1	..	7	1	2	..	..	..	..	..	2	..	1	2	..	5	..
	CALIFORNIA																		
3	University of California School of Medicine, San Francisco	..	1	..	1	1	..	..	..	..	1	..	1	1	1	..	..	..	..
4	College of Medical Evangelists, Loma Linda-Los Angeles	1	..	4	10	3	..	..	1	..	2	10	1	1	..	2	..	1	..
5	University of Southern California School of Medicine, Los Angeles	..	..	..	..	..	1	..	..	..	..	..	3	..	..	..	..	..	1
6	Stanford University School of Medicine, Stanford University-San Francisco	..	..	..	4	1	..	..	..	..	..	..	1	..	1	..	..	1	..
	COLORADO																		
7	University of Colorado School of Medicine, Denver	..	1	1	7	..	1	..	..	..	..	4	2	2	..	..	..	..	..
	CONNECTICUT																		
8	Yale University School of Medicine, New Haven	..	..	..	11	1	32	..	1	..	..	..	5	3	1	1	..	3	2
	DISTRICT OF COLUMBIA																		
9	Georgetown University School of Medicine, Washington	1	1	..	11	1	4	..	23	..	..	..	..	1	1	..	2	2	1
10	George Washington University School of Medicine, Washington	..	..	1	15	1	1	..	18	..	3	2	5	2	..	1	1	..	..
11	Howard University College of Medicine, Washington	3	..	..	6	..	..	..	12	..	1	..	..	..	..	..	..	1	..
	GEORGIA																		
12	Medical College of Georgia, Augusta	5	..	1	1	..	..	..	..	..	..	..	..	..	..	1	1	..	..
13	Emory University School of Medicine, Emory University	3	..	..	2	..	1	..	2	..	1	1	..	..	2	..	..	1	..
	ILLINOIS																		
14	Chicago Medical School	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
15	Northwestern University Medical School, Chicago	3	1	2	41	4	1	..	1	..	..	1	14	8	6	3	1	2	1
16	Stritch School of Medicine of Loyola University, Chicago	..	..	..	11	1	..	..	..	..	1	..	12	6	2	1	..	..	..
17	University of Chicago, The School of Medicine	1	..	1	20	2	3	..	..	..	..	1	4	1	2	1	..	1	2
18	University of Illinois College of Medicine, Chicago	1	3	..	51	3	1	..	1	..	1	1	14	9	7	2	1	..	..
	INDIANA																		
19	Indiana University School of Medicine, Bloomington-Indianapolis	..	..	..	14	2	4	..	..	..	..	..	12	1	2	2	4	2	..
	IOWA																		
20	State University of Iowa College of Medicine, Iowa City	..	1	..	16	3	3	..	1	..	..	..	7	3	10	2	1	..	..
	KANSAS																		
21	University of Kansas School of Medicine, Lawrence-Kansas City	..	..	..	16	4	..	..	1	..	..	3	..	3	..	..	1	2	..
	KENTUCKY																		
22	University of Louisville School of Medicine	1	1	1	16	..	..	..	..	..	5	..	4	13	3	2	1	3	..
	LOUISIANA																		
23	Louisiana State University School of Medicine, New Orleans	2	..	..	2	..	1	..	..	..	..	1	1	..	2	1	..	..	..
24	Tulane University of Louisiana School of Medicine, New Orleans	8	1	2	11	1	2	..	2	..	9	..	2	..	1	3	..	4	..
	MARYLAND																		
25	Johns Hopkins University School of Medicine, Baltimore	2	..	..	6	..	2	..	6	..	6	..	5	5	1	2	1	1	1
26	University of Maryland School of Medicine and College of Physicians and Surgeons, Baltimore	..	1	..	7	2	4	..	4	..	..	..	2	2	3	..	1	1	..
	MASSACHUSETTS																		
27	Boston University School of Medicine	1	1	..	8	..	8	..	5	..	..	..	3	1	..	..	1	..	1
28	Harvard Medical School, Boston	3	2	..	32	6	11	..	3	..	2	..	9	..	4	4	..	3	2
29	Tufts College Medical School, Boston	..	..	..	11	1	13	1	..	..	..	..	6	..	1	1	1	1	1
	MICHIGAN																		
30	University of Michigan Medical School, Ann Arbor	1	5	..	25	2	4	..	1	..	1	..	3	4	1	2	..	3	..
31	Wayne University College of Medicine, Detroit	..	1	2	11	1	..	..	..	..	..	..	1	2	..	..	..	1	..
	MINNESOTA																		
32	University of Minnesota Medical School, Minneapolis	..	5	1	30	2	..	..	..	..	2	4	2	1	4	..	1	..	..
	MISSOURI																		
33	St. Louis University School of Medicine	..	3	..	14	..	2	..	1	..	..	..	9	3	1	3	1	..	1
34	Washington University School of Medicine, St. Louis	3	1	2	13	3	..	..	2	..	2	..	7	1	4	3	1	..	..
	NEBRASKA																		
35	Creighton University School of Medicine, Omaha	..	..	..	10	4	1	..	1	..	..	3	5	..	2	1	..	..	..
36	University of Nebraska College of Medicine, Omaha	..	2	1	15	8	1	..	2	..	..	1	3	..	12	3	2	..	1
	NEW YORK																		
37	Albany Medical College, Albany	..	1	..	4	..	4	..	..	..	..	..	3	2	1	..	1	..	3
38	State University of New York, State University Medical Center at New York City, College of Medicine, Brooklyn	..	..	..	15	..	12	..	4	..	..	1	..	..	..	..	..	2	2 4
39	University of Buffalo School of Medicine	..	..	..	9	..	2	..	3	..	..	1	3	..	..	..	..	..	2
40	Columbia University College of Physicians and Surgeons, New York	3	..	1	18	2	16	..	1	..	1	1	8	2	3	..	2	..	1
41	Cornell University Medical College, New York	3	..	..	12	2	11	..	1	..	1	..	4	..	..	..	..	..	..
42	New York Medical College, Flower and Fifth Avenue Hospitals, New York	..	1	..	13	2	8	..	..	..	..	..	3	4	..	..	..	1	1
43	New York University College of Medicine, New York	2	3	..	34	..	6	..	..	..	1	..	3	..	2	..	2	2	..
44	University of Rochester School of Medicine and Dentistry	1	..	..	6	3	3	..	..	..	1	..	1	..	..	..	..	..	..
45	State University of New York, Medical Center at Syracuse University, School of Medicine	1	1	..	2	..	3	..	..	..	..	..	5	1	..	..	..	..	..
	NORTH CAROLINA																		
46	Duke University School of Medicine, Durham	1	..	1	7	1	2	..	3	..	3	1	8	..	..	..	..	2	..
47	Bowman Gray School of Medicine of Wake Forest College, Winston-Salem	..	1	..	2	..	..	..	1	..	3	..	1	..	1	..	..	3	..
	OHIO																		
48	University of Cincinnati College of Medicine	..	1	..	12	..	..	1	2	..	1	..	5	10	4	..	8	1	..
49	Western Reserve University School of Medicine, Cleveland	..	2	..	8	1	3	..	3	..	1	1	7	3	1	1	..	..	..
50	Ohio State University College of Medicine, Columbus	2	..	..	16	..	1	..	..	..	..	..	6	4	2	..	2	1	..
	OKLAHOMA																		
51	University of Oklahoma School of Medicine, Oklahoma City	..	..	4	10	2	..	..	..	..	..	1	1	1	1	1	1	2	..
	OREGON																		
52	University of Oregon Medical School, Portland	..	..	1	11	..	..	..	1	..	..	1	3	1	3	1	1	..	..
	Marginal Number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18

19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	
Maryland	Massachusetts	Michigan	Minnesota	Mississippi	Missouri	Montana	Nebraska	Nevada	New Hampshire	New Jersey	New Mexico	New York	North Carolina	North Dakota	Ohio	Oklahoma	Oregon	Pennsylvania	Rhode Island	South Carolina	South Dakota	Tennessee	Texas	Utah	Vermont	Virginia	Washington	West Virginia	Wisconsin	Wyoming	Alaska, Hawaii, Puerto Rico and Virgin Islands	Totals	Marginal Number
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	1	..	..	..	..	..	..	..	..	5	1
..	..	4	1	3	6	..	..	1	..	2	..	1	1	..	2	3	..	..	2	..	..	4	26	..	..	2	..	..	1	..	..	82	2
3	..	..	..	..	..	..	1	..	1	..	..	3	..	..	1	..	1	1	..	..	..	1	1	1	..	..	2	..	..	..	1	24	3
4	3	5	3	1	6	3	2	..	..	..	1	3	2	1	6	1	4	2	..	..	2	4	12	..	..	1	9	..	1	..	6	117	4
2	2	1	1	..	..	..	..	1	..	..	..	3	1	..	1	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	18	5
1	..	3	3	..	1	..	..	..	..	..	..	5	..	..	..	..	..	2	..	..	..	..	..	..	1	..	1	..	..	..	1	26	6
1	..	5	1	1	..	3	2	..	..	1	5	3	..	..	2	..	2	..	1	..	..	1	4	..	..	..	4	1	3	1	..	59	7
3	5	3	3	..	2	..	..	..	2	1	1	9	..	..	2	..	..	4	1	..	..	1	2	..	1	1	..	1	..	..	1	103	8
14	4	5	..	..	1	..	..	1	1	12	2	22	1	..	3	..	..	6	2	..	..	..	1	..	1	9	..	..	..	1	3	137	9
11	3	5	4	1	1	..	..	1	..	1	..	11	..	..	5	2	1	4	..	2	..	3	5	1	..	13	1	..	3	..	3	131	10
1	1	2	1	..	1	..	..	..	..	1	..	4	2	..	4	..	..	3	..	..	..	1	2	..	..	1	..	..	..	..	1	48	11
..	..	..	..	1	..	..	..	..	..	1	..	..	2	..	..	..	..	1	..	7	..	2	4	..	..	2	..	..	..	..	..	30	12
1	1	1	1	1	..	..	..	..	..	1	..	2	1	..	3	..	..	..	..	1	..	3	4	..	..	2	..	..	1	..	..	36	13
..	..	..	..	..	..	..	..	..	..	1	..	4	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	5	14
3	2	6	6	..	5	..	..	..	2	..	6	8	7	1	8	4	2	6	..	..	1	3	20	4	1	2	6	2	19	1	2	216	15
..	..	7	1	..	1	..	..	..	..	2	..	..	..	..	4	..	..	..	1	..	..	1	6	1	..	..	..	..	8	1	..	67	16
3	1	3	1	..	2	2	..	..	..	..	3	1	1	1	3	1	3	1	..	..	..	1	5	..	..	..	1	..	1	1	2	76	17
1	1	11	3	3	4	1	2	..	..	..	2	6	3	2	4	..	1	5	..	..	..	..	5	..	1	3	3	..	12	2	..	173	18
2	1	6	..	1	4	..	..	..	..	..	3	4	..	..	8	..	..	3	..	2	..	..	9	..	..	2	1	2	3	1	2	97	19
..	..	6	6	..	3	..	1	..	1	1	1	3	..	..	4	..	1	3	..	..	2	..	7	1	..	..	2	..	3	..	..	92	20
1	1	2	..	..	34	..	1	..	..	..	1	..	..	..	2	3	..	3	..	1	..	..	5	1	..	..	..	..	..	..	..	85	21
1	2	3	3	3	4	..	1	1	..	1	..	6	4	1	14	1	1	2	..	2	1	1	8	1	..	2	1	3	1	1	1	120	22
2	..	2	..	4	2	2	..	..	..	3	1	2	3	..	4	1	..	..	..	1	..	..	14	1	..	..	1	2	1	..	..	56	22
1	1	2	4	12	2	..	..	..	..	2	..	7	6	..	1	3	..	4	..	3	..	1	34	..	..	1	3	..	..	..	2	135	24
6	14	6	2	1	1	..	1	..	..	3	..	13	8	..	8	1	1	5	..	2	..	..	7	..	1	7	1	1	..	..	1	128	25
3	2	1	..	1	1	..	..	..	..	1	2	8	3	..	3	..	1	6	1	1	..	..	6	1	..	7	..	4	..	..	1	80	26
2	18	2	1	..	1	..	..	..	2	2	..	11	..	..	2	1	1	3	1	..	..	2	..	..	1	1	..	..	1	..	..	81	27
3	30	4	14	..	1	1	1	..	4	4	4	43	1	..	17	..	..	7	1	..	..	..	7	2	3	2	7	..	1	..	1	268	28
2	33	4	..	..	1	..	1	..	9	1	..	12	1	..	3	..	2	9	6	..	..	..	2	.	2	2	3	..	..	..	..	156	29
2	1	3	5	1	1	2	..	1	..	5	..	15	1	..	15	..	4	7	..	..	2	1	6	1	..	1	2	..	4	2	1	135	30
..	..	..	..	2	..	..	..	..	..	2	..	8	1	..	3	..	..	1	..	..	..	..	6	..	..	..	..	1	1	1	..	45	31
..	2	7	3	..	..	2	1	..	..	2	1	6	2	2	4	..	5	5	..	..	1	2	10	1	..	1	4	1	17	1	..	132	32
1	1	10	1	..	1	1	..	..	..	1	1	1	..	..	16	6	..	3	2	..	..	..	11	..	..	1	7	1	..	2	1	106	33
3	1	6	6	1	1	2	1	..	..	2	..	6	..	..	6	2	1	1	..	..	..	1	14	3	..	3	8	1	4	..	..	115	34
2	1	1	3	..	2	1	9	1	..	1	..	3	..	..	..	..	2	..	..	..	2	..	4	..	..	..	7	1	1	2	..	70	35
..	..	8	8	..	4	3	..	..	..	2	..	1	2	..	3	2	3	1	..	..	2	..	5	..	..	1	9	3	2	3	..	113	36
1	2	3	2	..	1	..	..	2	1	1	..	25	..	..	..	..	1	1	..	1	..	..	3	..	2	1	..	..	..	..	..	66	37
2	6	3	5	1	..	..	1	..	..	9	..	48	1	..	6	..	..	1	..	..	..	..	4	2	1	..	..	1	1	..	1	127	38
4	2	6	3	2	..	..	..	..	..	..	..	45	2	..	5	..	1	4	..	..	..	..	3	..	..	1	1	..	2	..	..	105	39
1	13	6	4	..	2	..	..	..	3	14	1	76	2	..	5	1	..	6	..	..	2	2	7	..	4	4	3	2	..	..	2	220	40
1	5	3	1	..	..	1	..	..	1	6	1	29	1	..	5	..	..	6	1	1	..	..	5	1	2	1	2	..	1	..	2	111	41
..	4	1	3	..	..	..	..	1	..	19	1	68	3	..	4	..	..	9	..	..	..	..	4	1	..	2	..	..	..	..	1	153	42
4	7	4	..	1	..	..	1	..	1	22	1	93	..	..	4	1	..	5	..	..	..	2	9	..	..	2	1	..	1	..	..	214	43
..	4	1	2	1	2	..	..	..	1	1	..	28	2	..	3	..	2	4	..	..	..	1	1	3	2	..	3	1	..	2	..	81	44
1	4	2	4	..	..	..	..	..	..	2	..	25	..	..	2	1	..	5	..	..	..	..	2	..	1	..	..	..	2	..	2	66	45
1	5	5	6	1	1	..	1	..	1	2	..	5	16	..	4	1	..	3	..	2	..	3	7	..	1	5	..	..	..	..	..	99	46
..	..	3	..	..	..	..	..	..	..	2	..	..	..	..	..	..	..	..	..	2	1	5	3	..	..	1	..	..	..	..	..	29	47
2	3	7	..	..	3	..	..	..	..	1	1	3	2	..	1	..	1	4	..	..	..	..	2	1	..	2	..	..	1	..	..	79	48
..	2	3	1	..	..	1	..	..	..	1	..	3	5	..	2	..	..	3	..	1	..	1	2	1	..	1	1	1	3	..	1	64	49
..	1	5	1	1	..	1	..	..	..	..	2	2	1	..	..	..	..	2	..	..	..	1	6	..	..	..	2	2	..	1	..	62	50
..	1	3	4	..	2	..	..	..	1	..	2	1	1	..	1	2	..	..	..	..	1	..	12	2	..	1	1	..	1	1	1	62	51
..	..	1	2	..	..	1	..	..	..	..	..	..	..	..	1	..	5	2	..	..	..	..	2	1	..	..	12	..	1	..	1	52	52
19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	

Marginal Number	SCHOOL	1 Alabama	2 Arizona	3 Arkansas	4 California	5 Colorado	6 Connecticut	7 Delaware	8 Dist. of Columbia	9 Florida	10 Georgia	11 Idaho	12 Illinois	13 Indiana	14 Iowa	15 Kansas	16 Kentucky	17 Louisiana	18 Maine
	PENNSYLVANIA																		
53	Hahnemann Medical College and Hospital of Philadelphia	1	..	..	17	..	3	1	1	..	..	1	..	2	..	..	..	..	1
54	Jefferson Medical College of Philadelphia	1	3	1	10	1	..	..	6	..	..	..	5	2	1	2	2	1	1
55	Temple University School of Medicine, Philadelphia	2	1	..	11	..	1	1	7	..	2	..	2	3	1	..	1	2	..
56	University of Pennsylvania School of Medicine, Philadelphia	3	..	..	17	1	3	..	1	..	..	..	9	4	2	1	4	3	2
57	Woman's Medical College of Pennsylvania, Philadelphia	..	..	..	3	..	1	1	..	..	3	1	..	1	..	1	..	..	2
58	University of Pittsburgh School of Medicine	1	1	..	10	1	..	..	1	..	1	..	4	1	1	1	1	..	1
	SOUTH CAROLINA																		
59	Medical College of the State of South Carolina, Charleston	2	..	..	4	..	..	..	..	..	4	..	..	1	1	..	2	..	..
	TENNESSEE																		
60	University of Tennessee College of Medicine, Memphis	9	..	6	5	1	..	..	4	..	3	1	3	1	1	..	15	7	..
61	Meharry Medical College, Nashville	4	..	..	9	..	..	..	3	..	1	..	2	2	..	..	1	1	..
62	Vanderbilt University School of Medicine, Nashville	8	..	1	6	..	3	..	..	..	3	..	2	2	3	..	2	1	..
	TEXAS																		
63	Southwestern Medical School of the University of Texas, Dallas	..	..	..	4	..	..	..	1	..	..	1	..	1	..	..	..	2	..
64	University of Texas School of Medicine, Galveston	..	..	2	7	..	1	..	..	..	..	2	..	1	1	1	..	3	..
65	Baylor University College of Medicine, Houston	..	..	..	2	..	..	..	1	..	..	1	2	..	1	..	..	1	..
	UTAH																		
66	University of Utah School of Medicine, Salt Lake City	..	..	..	11	..	..	..	..	..	..	3	..	..	1	1	..	1	..
	VERMONT																		
67	University of Vermont College of Medicine, Burlington	..	..	..	10	..	8	..	1	..	2	..	1	..	1	..	..	..	4
	VIRGINIA																		
68	University of Virginia Department of Medicine, Charlottesville	1	1	1	2	..	2	..	6	..	3	..	1	..	1	2	5	4	1
69	Medical College of Virginia, Richmond	1	..	2	5	..	1	..	6	..	3	..	..	2	..	1	..	2	1
	WASHINGTON																		
70	University of Washington School of Medicine, Seattle	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	WISCONSIN																		
71	University of Wisconsin Medical School, Madison	..	1	..	9	..	..	1	..	..	..	2	5	2	1	4	1	1	..
72	Marquette University School of Medicine, Milwaukee	..	1	1	11	1	..	..	..	..	..	..	5	3	3	..	..	1	..
	CANADA																		
73	University of Alberta Faculty of Medicine, Edmonton	..	..	..	3	..	..	..	..	..	..	..	1	..	..	..	..	..	..
74	University of Manitoba Faculty of Medicine, Winnipeg	..	..	..	4	..	..	..	..	..	..	1	..	..	..	..	..	..	..
75	Dalhousie University Faculty of Medicine, Halifax	1	..	..	2	..	1	..	..	..	..	..	..	..	..	..	..	..	..
76	Queen's University Faculty of Medicine, Kingston	..	..	..	..	1	..	..	..	..	..	..	..	..	2	..	..	..	..
77	University of Western Ontario Faculty of Medicine, London	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..
78	University of Toronto Faculty of Medicine, Toronto	..	..	..	5	..	1	..	..	..	..	..	1	..	..	..	1	..	..
79	McGill University Faculty of Medicine, Montreal	..	..	1	9	..	3	1	..	..	..	..	..	..	2	2	1	1	1
80	University of Montreal Faculty of Medicine, Montreal	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..
81	Laval University Faculty of Medicine, Quebec	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	OTHERS																		
82	Foreign Medical Faculties	..	..	..	1	..	10	..	7	..	1	..	..	..	4	..	..	..	1
83	Extinct Medical School	3	..	1	20	2	2	..	..	..	2	2	2	5	3	1	..	1	..
84	Unapproved Medical Schools	..	..	..	5	..	..	..	1	..	..	..	..	..	..	..	..	..	1
85	Schools of Osteopathy	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..
86	TOTALS	92	50	42	837	79	216	7	154	0	78	54	251	134	124	63	75	84	55
	Marginal Number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18

table 13. The Middle Atlantic and East North Central group of states added the greatest number, 1,186 and 1,123, respectively. More than 600 were added in four other groups—West North Central, 682, South Atlantic, 811, West South Central, 655 and the Pacific states, 634. The New England states added 333, the East South Central, 397, the Mountain States 131 and the territories and outlying possessions, 50.

In the sixteen years from 1935 to 1950, inclusive, there were 99,076 physicians added to the medical profession in the United States. Figures for each year during this period are presented in table 14. Of the 99,076 additions, 85,541 were licensed after a successful written examination and 13,535 by reciprocity or endorsement of credentials. In the same period 168,144 licenses were issued, 98,840 by examination and 69,304 by endorsement of credentials. These figures indicate that 69,068 licenses were obtained by physicians who had previously been licensed to practice medicine and 99,076 were actual additions to the medical profession.

Estimated figures indicate that on December 15, 1950 the total number of physicians in continental United States was 209,040, of whom 150,220 were estimated as in private practice. The figure includes 58,820 licensed physicians engaged in full time research, teaching and administration. It also includes physicians who have retired, interns and residents in hospitals, and those in the government services.

Preprofessional Requirement of Licensing Boards

The minimum requirement of the Council on Medical Education and Hospitals and the Association of American Medical Colleges for admission to approved medical schools since 1918 has been two years of college training. In 1938 both these agencies recommended that at least three years of college work be required of all candidates for admission. With the exception of California, the state licensing boards (table 15) require that an applicant for licensure present evidence of having completed two years of college. Seventy-six of the 79 medical and basic science schools in the United States require three or more years of premedical work. Six of the Canadian medical schools have a similar requirement.

Professional Educational Requirements of Licensing Boards

The medical practice acts or board rulings of several state medical boards state in terms of hours, weeks or months the length of the medical school academic year,

19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	
Maryland	Massachusetts	Michigan	Minnesota	Mississippi	Missouri	Montana	Nebraska	Nevada	New Hampshire	New Jersey	New Mexico	New York	North Carolina	North Dakota	Ohio	Oklahoma	Oregon	Pennsylvania	Rhode Island	South Carolina	South Dakota	Tennessee	Texas	Utah	Vermont	Virginia	Washington	West Virginia	Wisconsin	Wyoming	Alaska, Hawaii, Puerto Rico and Virgin Islands	Totals	Marginal Number
1	1	2	..	..	..	..	..	..	..	16	1	16	..	..	3	..	..	21	..	..	..	..	3	2	..	2	..	1	1	..	1	98	53
4	3	5	2	1	2	3	..	..	1	17	2	15	4	..	6	1	1	19	..	1	..	..	6	1	..	3	..	3	1	..	2	139	54
1	1	4	3	..	..	..	..	1	2	6	1	14	3	..	5	1	..	16	..	3	2	1	2	..	..	4	1	4	1	..	4	114	55
9	7	9	2	..	3	..	2	..	..	10	2	18	2	1	4	1	1	27	..	1	..	4	8	4	..	3	3	4	2	..	..	177	56
4	2	2	..	..	2	..	..	..	..	4	..	5	..	..	2	..	..	3	..	..	..	..	..	..	..	..	..	..	1	..	..	38	57
..	2	5	1	..	..	..	..	..	..	2	1	5	..	..	4	..	..	3	..	..	..	..	2	..	..	1	..	3	1	..	..	54	58
1	..	..	1	2	1	..	1	..	..	..	..	..	5	..	2	3	..	3	..	..	..	4	2	..	..	1	..	..	1	..	..	41	59
..	..	2	1	9	9	..	..	1	1	1	1	6	7	..	..	5	..	1	..	4	..	6	20	..	..	6	2	2	1	..	1	142	60
1	..	4	..	..	3	..	..	..	..	4	..	6	1	..	7	..	..	5	..	..	..	..	4	..	..	2	..	..	..	..	1	61	61
..	2	3	1	3	2	..	..	..	..	2	..	3	1	..	2	1	1	..	..	2	..	1	2	..	..	3	1	1	..	..	..	62	62
..	1	1	2	..	..	..	..	..	..	..	1	..	..	..	1	2	1	..	..	..	..	..	1	..	..	..	..	..	..	..	..	19	63
..	..	4	2	..	4	..	..	..	..	..	..	2	..	..	..	..	..	2	..	..	..	..	1	..	..	..	..	..	..	..	..	33	64
..	..	5	..	..	1	..	..	1	..	1	4	1	..	..	..	2	..	..	..	..	..	1	2	2	..	..	..	..	..	..	..	28	65
1	..	3	1	..	..	..	..	1	..	..	..	2	1	..	..	..	..	1	..	..	1	..	1	5	..	..	..	..	..	..	..	34	66
..	4	..	..	..	..	..	..	..	4	2	..	17	..	..	1	..	..	3	..	..	..	..	2	..	5	1	..	1	1	..	1	69	67
5	1	6	..	..	..	..	..	1	..	1	1	7	4	..	2	2	..	2	..	2	..	4	2	2	..	5	1	8	1	..	..	87	68
4	1	..	1	1	..	1	..	..	..	4	1	8	8	..	8	..	1	1	..	2	..	7	3	..	..	5	..	8	1	..	..	89	69
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0	70
..	3	3	3	..	6	..	..	1	1	1	..	1	1	..	2	1	3	1	..	..	1	2	6	..	..	..	1	1	3	1	..	69	71
..	..	7	1	..	..	1	..	..	..	2	1	6	..	..	1	2	2	1	..	..	1	..	3	1	..	..	1	..	8	1	..	65	72
..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	5	73
..	..	1	..	..	..	..	..	..	1	..	..	..	..	..	1	1	..	..	..	..	..	..	..	..	..	..	2	..	1	..	..	12	74
..	..	..	..	2	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	7	75
..	..	..	1	..	..	..	..	..	..	1	..	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	7	76
..	..	..	..	1	..	..	..	..	..	..	..	1	..	..	..	1	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	5	77
1	..	..	..	3	1	1	..	1	..	1	..	7	..	..	2	..	1	..	..	..	..	..	2	..	..	1	..	..	..	..	..	29	78
1	3	3	1	2	2	1	..	1	1	1	2	5	2	..	1	1	..	..	..	..	1	..	1	..	..	..	2	..	3	..	..	55	79
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	80
..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	81
1	..	1	..	1	1	..	3	..	1	17	5	35	1	..	30	1	..	..	..	..	1	..	3	..	..	1	..	..	1	..	7	134	82
1	..	..	1	..	4	1	..	1	2	1	4	1	3	..	..	1	..	..	..	..	..	1	12	..	..	2	1	..	3	..	..	83	83
..	..	1	..	..	3	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	..	..	..	..	..	..	..	..	13	84
..	3	..	..	..	..	..	..	..	1	2	..	3	..	..	8	..	..	..	..	..	1	..	5	..	..	..	..	..	..	1	..	25	85
133	265	264	147	69	148	35	33	19	47	232	70	871	133	9	297	63	57	262	19	45	25	81	421	48	30	128	125	67	132	27	58	6,755	
19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	

as well as the total time in hours, weeks or months which must be spent in medical school. In other states the law or ruling reads that the professional educational requirement accepted for approval by the Council on Medical Education and Hospitals of the American Medical Association and the Association of American Medical Colleges is the regulation for licensure. Table 16 outlines the requirements of each state in this respect.

Nine states maintain their own list of approved medical schools in the United States and Canada. Six of these states accept the list of medical schools approved by the Council on Medical Education and Hospitals of the American Medical Association and/or the Association of American Medical Colleges. Twenty-six boards require applicants for licensure from medical schools in the United States to be graduates of medical schools approved by the Council. Three boards require membership in the Association of American Medical Colleges and eighteen boards require that schools be approved by the Council and in membership in the College Association. In the majority of instances this requirement is a formal regulation or is specified in the medical practice act. In only seven instances is it an informal policy.

Only one state, California, specifies in detail the number of hours which must be devoted to the subjects of the medical curriculum.

Required Internships

Six medical schools in the United States and three schools in Canada require their students to serve an internship. These schools are listed in table 17. Northwestern University Medical School discontinued this requirement in December 1950. All except one of these schools withhold the degree of Doctor of Medicine until the year of internship has been served. Duke issues the degree at the end of the four year medical course but obtains from each student a written agreement that he will spend two years in training in a hospital or laboratory. Several of the other schools requiring an internship will permit a student to substitute a year of laboratory work.

The licensing of 24 states, the District of Columbia, Alaska, Guam, Hawaii, Puerto Rico and the Virgin Islands require a year of internship for licensure. During the year Colorado, Kansas and Guam instituted the intern year requirement while it was discontinued by Montana and the Canal Zone. The licensing boards that require

the internship are listed in table 18. This table also indicates those states that require a rotating internship. Idaho no longer specifies that the internship must be a straight service. In addition, some states require the internship for graduates of medical faculties abroad and from reciprocity or endorsement applicants.

The hospitals approved for intern training by the Council on Medical Education and Hospitals of the American Medical Association are generally acceptable in those states requiring an internship for licensure. The current list of approved internships was published in the April 15, 1950 issue of THE JOURNAL. Additions to the list were published in the September 9, 1950 issue of THE JOURNAL.

TABLE 12.—*Licentiates Representing Additions to the Medical Profession, 1950*

	Examination	Reciprocity and Endorsement	Total
Alabama	36	5	41
Arizona	5	1	6
Arkansas	72	3	75
California	458	93	551
Colorado	70	7	77
Connecticut	18	75	93
Delaware	11	0	11
District of Columbi	18	42	60
Florida	63	0	63
Georgia	144	5	149
Idaho	2	4	6
Illinois	302	50	352
Indiana	112	15	127
Iowa	57	18	75
Kansas	89	7	96
Kentucky	88	32	120
Louisiana	176	0	176
Maine	9	13	22
Maryland	185	20	205
Massachusetts	27	135	162
Michigan	150	34	184
Minnesota	150	36	186
Mississippi	61	6	67
Missouri	198	9	207
Montana	5	0	5
Nebraska	94	2	96
Nevada	0	1	1
New Hampshire	5	14	19
New Jersey	39	51	90
New Mexico	1	3	4
New York	253	448	701
North Carolina	91	14	105
North Dakota	13	0	13
Ohio	309	39	348
Oklahoma	56	6	62
Oregon	34	4	38
Pennsylvania	294	101	395
Rhode Island	5	10	15
South Carolina	57	2	59
South Dakota	8	1	9
Tennessee	165	4	169
Texas	326	16	342
Utah	23	5	28
Vermont	11	11	22
Virginia	134	13	147
Washington	37	8	45
West Virginia	9	3	12
Wisconsin	104	8	112
Wyoming	2	2	4
Alaska, Guam, Hawaii, Puerto Rico and Virgin Islands	33	17	50
Total	4,609	1,393	6,002

Licensure Requirements for Interns and Residents

In the majority of states, physicians serving internships are not required to be licensed in the state in which the hospital where they are interning is located. Georgia, Nevada and Puerto Rico exact this requirement while Colorado, Delaware and Massachusetts require an intern to register with the licensing board.

The legal requirements for physicians engaged in residency training varies. Some states do not enforce a licensure regulation. A number of states, however, consider that residents are practicing medicine and require that such persons possess a license in the state. In some instances a resident must register with the licensing board and other state boards permit a physician to engage in a residency for a specified period before licensure.

TABLE 13.—*Licentiates Representing Additions to the Medical Profession Grouped in Geographic Divisions, 1950.*

	Examination	Reciprocity and Endorsement	Total
New England			
Maine	9	13	22
New Hampshire	5	14	19
Vermont	11	11	22
Massachusetts	27	135	162
Rhode Island	5	10	15
Connecticut	18	75	93
	75	258	333
Middle Atlantic			
New York	253	448	701
New Jersey	39	51	90
Pennsylvania	294	101	395
	586	600	1,186
East North Central			
Ohio	309	39	348
Indiana	112	15	127
Illinois	302	50	352
Michigan	150	34	184
Wisconsin	104	8	112
	977	146	1,123
West North Central			
Minnesota	150	36	186
Iowa	57	18	75
Missouri	198	9	207
North Dakota	13	0	13
South Dakota	8	1	9
Nebraska	94	2	96
Kansas	89	7	96
	609	73	682
South Atlantic			
Delaware	11	0	11
Maryland	185	20	205
District of Columbia	18	42	60
Virginia	134	13	147
West Virginia	9	3	12
North Carolina	91	14	105
South Carolina	57	2	59
Georgia	144	5	149
Florida	63	0	63
	712	99	811
East South Central			
Kentucky	88	32	120
Tennessee	165	4	169
Alabama	36	5	41
Mississippi	61	6	67
	350	47	397
West South Central			
Arkansas	72	3	75
Louisiana	176	0	176
Oklahoma	56	6	62
Texas	326	16	342
	630	25	655
Mountain			
Montana	5	0	5
Idaho	2	4	6
Wyoming	2	2	4
Colorado	70	7	77
New Mexico	1	3	4
Arizona	5	1	6
Utah	23	5	28
Nevada	0	1	1
	108	23	131
Pacific			
Washington	37	8	45
Oregon	34	4	38
California	458	93	551
	529	105	634
Territories and Possessions			
Alaska, Hawaii and Puerto Rico	33	17	50
Totals	4,609	1,393	6,002

The requirements of each licensing board for those engaged in intern or residency training are given in table 19.

Schedule of Written Examination Dates and Reciprocity Meetings

The schedule of state licensing boards for written examinations for medical licensure and meetings for the issuance of licenses by reciprocity and/or endorsement of credentials are tabulated in table 20. Examination dates and reciprocity meetings have in recent years been scheduled by many states at more frequent intervals to assist physicians to commence the practice of medicine without delay. This is particularly true with regard to the issuance of licenses without examination. The increase in the number of applicants for licensure since 1945 has added greatly to the duties and responsibilities of the officers of licensing boards. In some states temporary permits are granted enabling physicians to begin the practice of medicine immediately.

Medical License Fees

Table 21 lists for each state, territory and outlying possession the fee charged by the medical licensing board for registration by examination and also by reciprocity or endorsement of credentials. The examination fee tends to be uniform, the majority of the boards charging a fee of $25. The fee for a license without examination varies from $20 to $200.

Licensure on Government Credentials

In most of the states no provision is made in the medical practice act for the acceptance of government credentials as a basis for licensure, without examination. Nine licensing boards, however, will issue a license to a physician who has passed an examination for admission to the medical corps of the United States Army and Navy, the Public Health Service and the Veterans Administration. These states are California, Illinois, New York, Pennsylvania, Rhode Island, Texas, Utah, Virginia and Wisconsin.

Temporary Permits

The licensing boards of twenty states and Alaska, Puerto Rico and Virgin Islands provide for the issuance of temporary permits. These states, the length of validity of the permit and the number of permits granted during the last calendar year are shown in table 22. Florida, North Carolina and North Dakota were added to this group of states in 1950. Maine issues permits to summer camp physicians, Indiana, Nebraska and Virginia to reciprocity applicants until licensure is perfected, North Carolina to physicians serving residencies, North Dakota to displaced foreign physicians for practice in specified areas until citizenship is completed while Puerto Rico and Virgin Islands grant this privilege to physicians in government positions only. There were 677 permits issued by 19 boards. Four boards did not report the issuance of any permits in 1950.

Annual Registration

Thirty-two states, the District of Columbia, and Alaska require physicians to register their licenses annually or biennially. In table 23 are listed the licensing boards which have such a requirement and the fee charged. Some of these boards require such registration whether or not physicians reside in the state. Delaware and Florida initiated this requirement in 1950. The fee ranges from $1 to $10. Five states have a nonresident fee. Missouri, New York and West Virginia require biennial registration. Legislation was approved in Vermont in 1951.

Candidates Examined for Medical Licensure, 1946-1950

The numbers of candidates examined in the various states, territories and outlying possessions in five years, 1946 to 1950 inclusive, are recorded in table 24. For each year there is recorded the number who passed and failed licensing examinations. Totals for the five year period and the percentage of candidates who failed are also given.

TABLE 14.—*Licentiates Representing Additions to the Medical Profession, 1935-1950*

	Examination	Reciprocity and Endorsement	Total
1935	5,099	411	5,510
1936	5,548	629	6,177
1937	5,812	612	6,424
1938	5,759	501	6,260
1939	5,584	460	6,044
1940	5,432	455	5,887
1941	5,241	474	5,715
1942	5,560	454	6,014
1943	5,586	372	5,958
1944	6,495	470	6,965
1945	4,979	769	5,748
1946	5,362	1,608	6,970
1947	5,273	1,617	6,890
1948	4,942	1,694	6,636
1949	4,260	1,616	5,876
1950	4,609	1,393	6,002
Totals	85,541	13,535	99,076

TABLE 15.—*Requirements of Premedical Training by Medical Licensing Boards*

Two Years or More of College

Alabama	Massachusetts	Rhode Island
Arizona	Michigan	South Carolina
Arkansas	Minnesota	South Dakota
Colorado	Mississippi	Tennessee
Connecticut	Missouri	Texas
Delaware	Montana	Utah
District of Columbia	Nebraska	Vermont
Florida	Nevada	Virginia
Georgia	New Hampshire	Washington
Idaho	New Jersey	West Virginia
Illinois	New Mexico	Wisconsin
Indiana	New York	Wyoming
Iowa	North Carolina	Alaska
Kansas	North Dakota	Canal Zone
Kentucky	Ohio	Guam
Louisiana	Oklahoma	Hawaii
Maine	Oregon	Puerto Rico
Maryland	Pennsylvania	Virgin Islands

One Year of College

California

In the five year period shown 33,564 examinations were given. Of these, 29,874 were successful tests and 3,690, or 10.6 per cent, resulted in failures. New York gave the greatest number of examinations, 4,197. More than 2,000 examinations were also given in California and Pennsylvania and more than 1,000 were given in Florida, Michigan, Missouri, Ohio and Texas.

Massachusetts had the highest percentage of failures. By statute, the licensing board is required to admit to its examinations the graduates of medical schools which do not meet accepted standards and graduates of schools of osteopathy, many of whom repeatedly fail. The State Approving Authority of Massachusetts had ruled that students matriculating after January 1, 1941 in institutions not meeting the standards of this authority will not be eligible for licensure. The effect of this regulation is evident in the annual reduction in the number of failures.

New York had a percentage failure in the five year period of 48.4 and California's percentage of failures was 25.8. These states examine a considerable number of foreign trained physicians, many of whom are not successful in the first examination. Regulations admitting certain graduates of unapproved and osteopathic schools to the licensure examination in New York also resulted in a high percentage of failures in recent years.

a license in more than one state in a given year is counted in both states and likewise counted if he passed at examinations in later years. The totals in this table give only a fair approximation of the number of physicians added to the profession after written examination during the last five years. Table 12 gives the exact compilation of the number of physicians who constitute new additions to the medical profession.

TABLE 16.—*Professional Educational Requirements by Medical Licensing Boards*

	Length of Medical School Academic Year						Total Time Spent in Medical School (Registration to Graduation)						
	Hours	Weeks	Months	Same as Approved Medical Schools	Same as A.A.M.C. and C.M.E. and H.*	Not Specified by Board	Hours	Weeks	Months	Years	M.D. Degree	Same as Approved Medical Schools	Same as A.A.M.C. and C.M.E. and H.*
Alabama	..	..	9	..	..	..	..	..	..	4	..	..	..
Arizona	..	..	..	..	X	..	..	..	..	..	..	..	X
Arkansas	..	..	9	..	..	..	..	..	..	4	..	..	..
California	..	32	..	..	..	..	4,000	..	..	4	..	..	..
Colorado	..	..	..	..	..	X	..	..	..	..	X	..	..
Connecticut	..	32	..	..	..	..	..	..	28	..	X	..	..
Delaware	..	..	..	..	..	X	128	..	..	4	..	..	..
District of Columbia	..	..	9	..	..	..	..	..	36	..	..	..	..
Florida	..	..	9	..	..	..	..	..	..	4	..	..	..
Georgia	..	..	9	..	..	..	..	..	..	4	..	..	..
Idaho	..	..	9	..	..	..	..	..	..	4	..	..	..
Illinois	..	..	9	..	..	..	..	..	40	..	..	..	..
Indiana	..	..	8	..	..	..	..	..	42	..	..	..	..
Iowa	..	..	9	..	..	..	..	..	..	4	..	..	..
Kansas	..	..	9	..	..	..	..	..	..	4	..	..	..
Kentucky	..	..	8½	..	..	..	..	..	..	4	..	..	..
Louisiana	..	..	..	..	X	..	..	..	..	..	X	..	X
Maine	..	..	..	..	X	..	..	..	..	..	..	..	X
Maryland	..	..	..	..	X	..	..	..	..	..	..	..	X
Massachusetts	..	32	..	..	..	..	..	..	..	4	..	..	..
Michigan	..	32	..	..	..	..	..	..	36	..	..	..	..
Minnesota	..	36	..	..	..	..	..	..	..	4	..	..	..
Mississippi	..	32	8	..	..	..	..	..	..	4	..	..	..
Missouri	..	32	..	..	..	..	..	..	..	4	..	..	..
Montana	..	..	9	..	..	..	..	..	..	4	..	..	..
Nebraska	..	..	9	..	..	..	..	..	..	4	..	..	..
Nevada	..	..	9	..	..	..	..	..	..	4	..	..	..
New Hampshire	..	..	..	..	..	X	..	..	..	..	X	..	..
New Jersey	..	..	..	..	..	+	..	..	..	4	..	..	..
New Mexico	..	..	..	X	..	..	..	..	..	..	X	X	..
New York	..	..	8	..	..	..	..	..	..	4	..	..	..
North Carolina	..	..	9	..	..	..	..	..	..	4	..	..	..
North Dakota	..	..	9	..	..	..	..	..	..	4	..	..	..
Ohio	..	..	8½	..	..	..	..	..	..	4	..	..	..
Oklahoma	..	..	..	..	..	X	..	..	..	..	X	..	..
Oregon	..	..	8	..	..	..	..	..	32	4	..	..	..
Pennsylvania	..	32	..	..	..	..	..	..	..	4	..	..	..
Rhode Island	..	..	..	..	..	X	..	..	..	..	X	..	..
South Carolina	..	..	9	..	..	..	..	..	..	4	..	..	..
South Dakota	..	..	..	..	..	X	..	..	..	4	..	..	..
Tennessee	..	..	9	..	..	..	..	..	36	..	..	..	..
Texas	..	..	8	..	..	..	..	..	..	4	..	..	..
Utah	..	..	9	..	..	..	..	..	..	4	..	..	..
Vermont	900	..	..	..	..	..	..	..	..	4	..	..	..
Virginia	..	32	8	..	..	..	..	..	..	4	..	..	X
Washington	..	..	..	..	X	..	..	..	..	..	X	..	X
West Virginia	..	..	..	..	..	X	..	..	..	4	..	..	X
Wisconsin	..	..	..	..	..	X	..	..	..	4	..	..	..
Wyoming	..	..	..	..	..	X	..	..	..	..	..	..	X
Alaska	..	..	..	..	X	..	..	..	..	..	..	..	..
Canal Zone	..	..	10	..	..	..	..	..	..	4	X	..	..
Guam	..	..	..	X	..	..	..	..	..	..	..	X	..
Hawaii	..	..	..	..	..	X	..	..	..	..	..	..	X
Puerto Rico	..	..	..	..	X	..	..	..	..	..	..	..	X
Virgin Islands	..	..	..	..	..	X	..	..	..	..	X	..	X

* Association of American Medical Colleges and Council on Medical Education and Hospitals of the American Medical Association.
X implies requirements are those of the accrediting agencies.

Nevada, New Hampshire and New Jersey had a failure percentage in five years of more than 10 per cent. Twenty-five states failed less than 5 per cent of those examined in the five year period. Eight states had no failures.

The annual percentage of failures for all boards in the five year period varied from 9.9 per cent to 12.5 per cent. The highest percentage was in 1949.

The foregoing figures represent examinations given and not individuals. A candidate who fails more than once in a state in a given year is counted only once, but should he again fail in a succeeding year this fact is computed among the failures for that year. In compiling the tabulations in this study, a successful candidate securing

Registration of Physicians, 1904-1950

A tabulation of totals and percentages for 47 years from 1904 to 1950, inclusive, is included in table 25. This study contains figures pertaining to the number of physicians examined and registered by written examination, the annual percentage of failures, the number registered annually by reciprocity or endorsement of credentials and the total registered. Reviewing the totals registered reveals no definite trend from 1904 to 1933 except in 1918 when 4,231 were licensed, the lowest registration in 47 years. This decrease was due to a sudden withdrawal of physicians from civilian life in World War I. After 1933 there was an upward trend for

a time, followed by a decline in the years 1940 to 1943 inclusive. There was a noticeable increase in 1943 as the result of the accelerated medical school curriculum and the universal effort on the part of medical educators of the country to maintain a steady flow of physicians for both civilian and military practice. In 1943 more physicians were registered than in any previous year.

The number registered in 1946 was almost double the number registered in 1945. Separation from service of a large number of medical officers and their return to private practice in states other than those in which they were licensed accounts in large part for this increase. In the years since 1945 the numbers registered has annually decreased although they far exceed the prewar totals.

In the present national emergency efforts are being made to further increase the production of physicians. There has been created a Joint Committee on Medical Education in Time of National Emergency representing the Council on Medical Education and Hospitals of the American Medical Association and the Association of American Medical Colleges. This committee has recommended that medical schools should exert effort to admit as many medical students as they can train without deterioration of the quality of medical training they can provide. The committee has further recommended that provision should be made for the increased financial support essential to the provision and maintenance of the increase in faculty, facilities and buildings required to accomplish the proposed increase in enrolments. The freshman class enrolled in medical schools for the session 1950-1951 exceeded 7,000 which is in excess of all previous enrolments. There was an increase of 1,433 students, or 6 per cent, in the total enrolment for the class of 1949-1950 and it is anticipated that the figures for 1950-1951 will be the highest in history. Medical schools are also being urged to reorganize their curriculum to give proper emphasis to subjects of particular importance for the national health, security and welfare in time of national emergency.

TABLE 17.—*Medical Schools Requiring an Internship*

United States

College of Medical Evangelists
University of Southern California School of Medicine
Stanford University School of Medicine
Chicago Medical School
University of Minnesota Medical School
Duke University School of Medicine *

CANADA

University of Manitoba Faculty of Medicine
Dalhousie University Faculty of Medicine
University of Montreal Faculty of Medicine

* Degree not withheld until internship completed.

TABLE 18.—*Medical Licensing Boards Requiring a One Year Internship**

Alabama	Nevada	Vermont [6]
Arizona	New Hampshire	Washington [1]
Colorado	New Jersey [1]	West Virginia
Delaware [1]	North Dakota [1]	Wisconsin [1]
District of Columbia	Oklahoma [1]	Wyoming [1]
Idaho	Oregon [1]	Alaska
Illinois [1]	Pennsylvania [1]	Guam
Iowa [1]	Rhode Island [1]	Hawaii [1]
Kansas	South Dakota	Puerto Rico [1]
Michigan [1]	Utah	Virgin Islands

* Some states require the internship for graduates of medical faculties abroad and from reciprocity or endorsement applicants.
1. Internship must be a rotating service.

In 1904, the first year shown, the percentage of failures was 19.3. This was an era of proprietary medical schools. The percentage of failures gradually dropped each year until 1930 when 5.7 per cent failed. With the migration of European physicians to this country beginning in 1936 and the resultant licensure difficulties, the percentage of failures began to rise reaching another peak of 20.7 per cent in 1940. Beginning in 1944 there was a decrease in the number of foreign trained physicians and graduates of unapproved medical schools although this has not lowered the percentage of failures.

TABLE 19.—*Licensure Requirements for Interns and Residents in Hospitals*

	Licensure in State Required for	
	Interns	Residents
Alabama	No	No
Arizona	No	No
Arkansas	No	Yes
California	No	Yes [1]
Colorado	No [2]	No [2]
Connecticut	No [2]	No [3]
Delaware	No [4]	No [4]
District of Columbia	No	Yes
Florida	No	Yes
Georgia	Yes	Yes
Idaho	No	Yes
Illinois	No	Yes
Indiana	No [5]	Yes
Iowa	No	Yes
Kansas	No	Yes
Kentucky	No	No
Louisiana	No	Yes
Maine	No	Yes
Maryland	No	No [3]
Massachusetts	No [4]	Yes
Michigan	No	Yes
Minnesota	No	Yes
Mississippi	No	Yes
Missouri	No	No
Montana	No	No
Nebraska	No	No [6]
Nevada	Yes	Yes
New Hampshire	No	No
New Jersey	No [7]	No [7]
New Mexico	No	Yes
New York	No	No
North Carolina	No	Yes
North Dakota	No	Yes
Ohio	No	Yes
Oklahoma	No	Yes [9]
Oregon	No	No
Pennsylvania	No	Yes
Rhode Island	No	No
South Carolina	No	Yes
South Dakota	No	No
Tennessee	No	No
Texas	No	Yes
Utah	No	Yes
Vermont	No	No
Virginia	No [8]	No [8]
Washington	No	Yes
West Virginia	No	No
Wisconsin	No	Yes
Wyoming	No	No
Alaska	No	No
Canal Zone	No	No
Guam	No	No
Hawaii	No	No
Puerto Rico	Yes	Yes
Virgin Islands	No	No

1. May commence residency before licensure.
2. Interns and residents must register with board and may not continue such service for more than four years without license.
3. Required by some hospitals.
4. Registration with licensing board required.
5. Must be eligible for licensure.
6. Licensure recommended.
7. May have service of two years without licensure.
8. May have service of three years without licensure.
9. Temporary licensure granted for one year.

This table again refers to examinations given annually rather than individuals examined.

Graduates of Approved Schools and Others Registered, 1922-1950

In table 26 the numbers of physicians registered are grouped in two categories, namely, graduates of approved medical schools and others. In the computation of these figures, schools rated as Class A and B by the Council on

Medical Education and Hospitals of the American Medical Association since 1907 are classified as approved. In the column headed "Others" are included persons who graduated prior to 1907, when the first classification of medical schools was made by the Council, graduates of foreign faculties of medicine, class C graduates, osteopaths given recognition by medical licensing boards, and graduates of schools not approved by the Council. In 1928 the classification A, B, and C by the Council was discontinued and a list of approved medical schools has since been maintained.

TABLE 20.—*Schedule of Written Examination Dates and Issuance of Licenses by Reciprocity or Endorsement of Credentials*

	Written Examination	Licenses by Reciprocity or Endorsement Issued
Alabama	Once annually	Continuously
Arizona	Quarterly	Quarterly
Arkansas	Semi-annually	Continuously
California	Quarterly	Twelve meetings annually
Colorado	Semi-annually	Quarterly
Connecticut	March, July and Nov.	Continuously
Delaware	Semi-annually	Semi-annually
District of Colum	Semi-annually	Quarterly
Florida	Semi-annually	None
Georgia	June and October	Three times annually
Idaho	Semi-annually	Semi-annually
Illinois	Quarterly	Quarterly
Indiana	Annually, June	Six times annually
Iowa	Semi-annually	Continuously
Kansas	Semi-annually	Semi-annually
Kentucky	Semi-annually	Continuously
Louisiana	June, December	June, December
Maine	March, July, Nov.	March, July, November
Maryland	Semi-annually	Every five weeks
Massachusetts	January, July	Every month except Aug.
Michigan	June, October	Continuously
Minnesota	Quarterly	Quarterly
Mississippi	June	June, December
Missouri	Periodically	Periodically
Montana	Semi-annually	Semi-annually
Nebraska	Once annually in June	Continuously
Nevada	Quarterly	Quarterly
New Hampshire	Twice annually	Twice annually
New Jersey	June, October	Monthly except August
New Mexico	Semi-annually	Semi-annually
New York	Three times annually	Continuously
North Carolina	June	Five times annually
North Dakota	January, July	January, July
Ohio	June, December	Quarterly
Oklahoma	Annually	Quarterly
Oregon	Semi-annually	Quarterly
Pennsylvania	January, July	Monthly
Rhode Island	Quarterly	Quarterly
South Carolina	Semi-annually	Monthly
South Dakota	Semi-annually	Semi-annually
Tennessee	Every three months	Continuously
Texas	June, November	June, November
Utah	Annually, July	Semi-annually
Vermont	Semi-annually	Continuously
Virginia	Semi-annually	Semi-annually
Washington	Semi-annually	Semi-annually
West Virginia	Quarterly	Quarterly
Wisconsin	Semi-annually	Semi-annually
Wyoming	Three times annually	Three times annually
Alaska	March, September	Continuously
Canal Zone	As needed	As needed
Guam	As needed	As needed
Hawaii	January, July	Continuously
Puerto Rico	Semi-annually	Quarterly
Virgin Islands	Twice annually	Twice annually

In 1950 there were 12,236 candidates registered of whom 11,502 or 94 per cent represented graduates of approved schools and 734 (6.0 per cent) were in the second group. In the twenty-nine years recorded in this table, 261,014 were registered, including 234,698 approved graduates, 89.9 per cent and 26,316 others, 10.1 per cent.

Graduates of Unapproved Schools Registered, 1945-1950

Recorded in table 27 are data regarding graduates of institutions which have not been approved by the Council on Medical Education and Hospitals of the American Medical Association. In the main they represent five schools more recently in operation, all but one of which is now closed. The latter institution has obtained the status of an approved institution.

This table shows the number registered as medical licentiates in the United States, Alaska and Hawaii by written examination and by reciprocity and/or endorsement of credentials in the past six years, 1945-1950 inclusive. Figures are given separately for these two groups. In the six years shown, twenty-eight states, the District of Columbia, Alaska and Hawaii registered 1,012 by examination and 40 by endorsement. In 1950 there were 58 registered, 45 by examination and 13 without written examination by seventeen boards, Arkansas, California, District of Columbia, Florida, Georgia, Illinois, Maine, Massachusetts, Michigan, Mississippi, Missouri, New York, North Carolina, Ohio, Pennsylvania, Texas and Hawaii.

TABLE 21.—*Medical Licensure Fees*

	Examination	Reciprocity or Endorsement
Alabama	$ 10	$ 50
Arizona	25	100
Arkansas	25	50-100
California	25	100
Colorado	25	50
Connecticut	25	50 [1]
Delaware	25	100
District of Columbia	25	50
Florida	25	..
Georgia	20	50
Idaho	25	100
Illinois	15	25
Indiana	25	50
Iowa	25	50
Kansas	25	50
Kentucky	25	50
Louisiana	25	50 [2]
Maine	25	50
Maryland	20	50
Massachusetts	25	50 [3]
Michigan	25	50
Minnesota	20	75
Mississippi	10	50
Missouri	15	50 [2]
Montana	50	75
Nebraska	25	50
Nevada	100	200
New Hampshire	30	30
New Jersey	25	100
New Mexico	50	50
New York	25	25
North Carolina	15	50
North Dakota	25	50
Ohio	25	50
Oklahoma	25	100
Oregon	25	100
Pennsylvania	25	50
Rhode Island	20	20
South Carolina	25	50
South Dakota	20	50
Tennessee	25	50
Texas	25	50
Utah	25	50
Vermont	20	50
Virginia	25	50
Washington	25	25
West Virginia	25	100
Wisconsin	25	50
Wyoming	25	50
Alaska	25	100
Guam	50	50
Hawaii	25	25
Puerto Rico	30	30
Virgin Islands	65	50

1. Endorsement of certificate of National Board of Medical Examiners $25.
2. Same as charged by the reciprocating state if more than $50.
3. Endorsement of certificate of National Board of Medical Examiners $15.

Illinois, which accepted for licensure the graduates of one school not approved by the Council until late in 1948, New York and Florida, which have made certain concessions, and Massachusetts licensed the largest number of unapproved medical schools. In the latter state, the institutions referred to in the table were not granted approval by the State Approving Authority. Matriculants after January 1, 1941 are not eligible for licensure in Massachusetts.

Graduates of Schools of Osteopathy Registered by Medical Examining Boards, 1945-1950

In seventeen states and the District of Columbia during the last six years (1945-1950) graduates of schools of osteopathy have been granted the privilege of practicing medicine or surgery or both by the medical examining board. The states which have registered such candidates and the number so registered are given in table 28. There have been 1,084 such persons registered, 775 by written examination and 309 by reciprocity or endorsement. In 1950 there were 151 so registered, 126 by examination and 25 by reciprocity by thirteen boards—Colorado, Connecticut, District of Columbia, Indiana, Massachusetts, New Hampshire, New Jersey, New York, Ohio, South Dakota, Texas, Virginia and Wyoming.

Following is a summary of the situation in the seventeen states and the District of Columbia providing for the licensing of osteopaths by the medical examining board.

In 1947, Alabama registered a graduate of a school of mechanotherapy.

TABLE 22.—*Temporary Permits, 1950*

State	Permit Valid for:	Permits Granted
Arizona	Next board meeting	42
Delaware	Four months	4
Florida	One year	1
Georgia	Next board meeting	0
Idaho	Six months	14
Indiana [1]	Six months	134
Kansas	Next board meeting	45
Kentucky	1-5 years (limited license)	1
Louisiana	Next board meeting	92
Maine	Ten weeks for summer camp physicians	0
Mississippi	Next board meeting	69
Nebraska [1]	Until licensure is perfected	3
New Hampshire	Varies	0
New Jersey	Four months	9
New Mexico	Six months	63
North Carolina	Limited license for residents	53
North Dakota	For displaced physicians in specified areas until citizenship is completed	4
Oklahoma	One year for hospital residents	8
Virginia [1]	Next board meeting	61
West Virginia	Next board meeting	52
Alaska	Six months	19
Puerto Rico [2]	Until July 1951	0
Virgin Islands [2]	Six months	3
Total		677

1. Reciprocity applicants.
2. Government positions only.

In Colorado an osteopath receives a license to practice medicine. In Connecticut any registered osteopath may practice either medicine or surgery or both, according to the type of examination taken, if he passes a satisfactory examination before the medical examining board. In Delaware osteopaths are licensed as "osteopathic physicians." In the District of Columbia osteopaths are granted the right to practice surgery. In Indiana the licenses issued to osteopaths under a 1945 amendment to the medical practice act authorize the holders to practice medicine and surgery. Licentiates in osteopathy prior to 1945 have now been authorized to practice osteopathy, surgery and obstetrics. In Massachusetts the medical practice act by definition includes osteopathy in the practice of medicine and does not differentiate the type of license issued to an osteopathic applicant. According to a law passed in Nebraska in 1943, "any person now licensed to practice osteopathy may, if application was made prior to July 1, 1948 and on payment of the prescribed fee, take the first regular examination given after the application is made before the Board of Examiners in Medicine. . . . If successful, he or she shall receive a license to practice medicine and surgery in the state." In New Hampshire osteopaths are granted the right to practice medicine and surgery.

New Jersey provides that osteopaths licensed prior to November 1, 1941 who furnish proof prior to that date of having served for a period of two years as an intern or resident surgeon in an osteopathic or medical hospital

TABLE 23.—*States Requiring Annual Registration*

	Fee		Fee		Fee
Arizona	$ 5	Kansas	$ 1	Pennsylvania	$ 1
Arkansas	a	Louisiana	2	Tennessee	5
California	2	Minnesota	2	Texas	2
Colorado	b	Missouri *	1	Utah	3
Connecticut	2	Montana	5	Virginia	1
Delaware	10	Nebraska	1	Vermont [f]	..
Dist. of Columbia	2	Nevada	2	Washington	5
Florida	1	New Mexico	d	West Virginia *	2
Georgia	None	New York *	4	Wisconsin	3
Idaho	10	North Dakota	e	Wyoming	2.50
Indiana	c	Oklahoma	3	Alaska	10
Iowa	1	Oregon	10	Hawaii	2

a. Residents $2, Nonresidents $4.
b. Residents $2, Nonresidents $10.
c. Residents $5, Nonresidents $10.
d. Residents $2, Nonresidents $5.
e. Residents $5, Nonresidents $2.
f. Legislation approved April 11, 1951.
* Biennial registration.

TABLE 24.— *Candidates Examined, 1946-1950*

	1946		1947		1948		1949		1950		Totals for Five Years		
	P	F	P	F	P	F	P	F	P	F	P	F	%F
Alabama	20	0	97	0	16	2	46	1	39	0	218	3	1.4
Arizona	12	1	19	3	17	0	22	0	8	1	78	5	6.0
Arkansas	63	0	54	0	59	0	52	0	74	0	302	0	0.0
California	530	11	503	10	493	36	492	57	543	37	2,561	151	5.6
Colorado	77	0	95	0	72	2	78	0	76	0	398	2	0.5
Connecticut	55	10	49	17	32	7	29	15	29	19	194	68	25.8
Delaware	16	1	20	0	20	0	21	0	23	0	100	1	1.0
Dist. of Columbia	41	0	39	0	33	3	30	1	24	3	167	7	4.0
Florida	373	62	314	17	301	26	308	19	325	46	1,621	170	9.5
Georgia	168	2	129	0	131	1	109	4	147	1	684	8	1.2
Idaho	54	0	62	0	51	0	38	1	1	0	206	1	0.5
Illinois	751	33	605	16	512	44	367	67	399	60	2,634	220	7.8
Indiana	139	16	111	12	99	2	98	4	112	3	559	37	6.2
Iowa	57	4	55	0	67	0	57	0	86	1	322	5	1.5
Kansas	102	0	86	0	67	0	99	1	96	1	450	2	0.4
Kentucky	166	0	90	0	60	0	86	0	88	0	490	0	0.0
Louisiana	189	1	225	1	182	0	164	1	190	1	950	4	0.4
Maine	45	4	31	2	31	3	25	4	19	1	151	14	8.5
Maryland	204	4	175	6	185	8	172	17	183	10	919	45	4.7
Massachusetts	89	163	84	140	65	111	41	92	26	71	305	577	65.4
Michigan	215	0	116	0	181	0	164	0	195	0	871	0	0.0
Minnesota	313	0	248	0	212	1	188	0	201	0	1,158	1	0.1
Mississippi	45	0	59	0	47	0	35	5	64	1	250	6	2.3
Missouri	251	1	265	0	238	0	198	0	206	0	1,158	1	0.1
Montana	17	0	8	0	10	1	8	0	5	0	48	1	2.0
Nebraska	81	5	87	3	84	16	52	4	96	3	400	31	7.2
Nevada	15	3	8	0	3	1	4	1	0	0	30	5	14.3
New Hampshire	20	4	10	0	10	1	7	1	6	1	53	7	11.7
New Jersey	116	5	89	13	90	22	76	9	41	11	412	60	12.7
New Mexico	1	0	1	0	3	0	4	1	2	0	11	1	8.3
New York	427	386	610	482	426	371	411	397	290	397	2,164	2,033	48.4
North Carolina	95	0	113	1	112	0	88	0	97	1	505	2	0.4
North Dakota	13	0	25	0	30	0	24	0	35	3	127	3	2.3
Ohio	340	10	297	3	322	7	262	6	326	19	1,547	45	2.8
Oklahoma	68	0	72	0	59	0	47	1	82	0	328	1	0.3
Oregon	50	3	80	0	48	0	47	4	38	2	263	9	3.3
Pennsylvania	463	3	437	3	448	6	396	3	326	2	2,070	17	0.8
Rhode Island	40	0	32	0	21	0	15	1	12	3	120	4	3.2
South Carolina	53	0	55	0	57	0	43	1	59	0	267	1	0.4
South Dakota	10	0	18	0	27	0	10	0	20	0	85	0	0.0
Tennessee	157	1	148	0	150	0	177	0	142	0	774	1	0.1
Texas	266	14	282	13	262	33	184	10	277	16	1,271	86	6.3
Utah	79	0	0	0	18	0	30	0	29	0	156	0	0.0
Vermont	5	0	27	1	16	0	11	4	15	1	74	6	7.5
Virginia	174	2	130	4	136	4	109	5	138	1	687	16	2.3
Washington	130	0	116	0	110	0	72	0	60	0	488	0	0.0
West Virginia	64	0	40	0	55	0	61	0	42	0	262	0	0.0
Wisconsin	123	1	143	0	182	7	109	0	130	0	687	8	1.1
Wyoming	0	0	0	0	0	0	1	0	2	0	3	0	0.0
U. S. Territories and Possessions	74	4	55	3	54	5	56	7	57	6	296	25	7.8
Total examined	7,610		7,164		6,624		5,963		6,203		33,564		
Passed	6,856		6,414		5,904		5,219		5,481		29,874		
Failed	754		750		720		744		722		3,690		
Percentage failed	9.9		10.5		10.8		12.5		11.6		10.6		

approved by the board of medical examiners, of having completed a postgraduate course of two years in a college of osteopathy or medicine approved by the board or of having had at least three years of practice in a hospital

TABLE 25.—*Registration of Physicians 1904-1950*

Year	Examined	Passed	Per-centage Failed	Reciprocity or Endorse-ment	Total Regis-tered
1904	7,056	5,698	19.3	1,005	6,698
1905	7,178	5,688	20.8	394	6,082
1906	8,040	6,373	20.7	1,502	7,875
1907	7,279	5,731	21.3	1,427	7,158
1908	7,775	6,089	21.7	1,284	7,373
1909	7,295	5,865	19.6	1,381	7,246
1910	7,011	5,719	18.4	1,640	7,359
1911	6,964	5,582	19.8	1,243	6,825
1912	6,880	5,467	20.5	1,273	6,740
1913	6,453	5,258	18.6	1,292	6,545
1914	5,579	4,379	21.5	1,439	5,818
1915	5,334	4,507	15.5	1,399	5,906
1916	4,878	4,151	14.9	1,353	5,504
1917	4,754	4,085	14.0	1,360	5,445
1918	3,997	3,184	13.2	1,047	4,231
1919	4,750	4,074	14.2	2,546	6,620
1920	4,796	4,062	15.3	2,558	6,620
1921	4,825	4,228	12.4	2,186	6,414
1922	4,031	3,539	12.2	2,073	5,612
1923	4,727	4,028	14.8	2,405	6,433
1924	5,392	4,756	11.8	1,923	6,679
1925	6,002	5,450	9.2	1,861	7,311
1926	5,770	5,314	7.9	1,955	7,269
1927	5,389	5,022	7.2	2,176	7,178
1928	5,458	5,090	6.7	2,228	7,318
1929	5,629	5,282	6.2	2,420	7,702
1930	5,571	5,255	5.7	2,366	7,621
1931	5,611	5,263	6.2	2,211	7,476
1932	5,675	5,247	7.6	1,886	7,133
1933	5,673	5,244	7.6	1,989	7,233
1934	6,145	5,628	8.4	2,161	7,789
1935	6,443	5,859	9.1	2,194	8,053
1936	6,918	6,224	10.0	2,773	8,997
1937	7,334	6,604	10.0	3,205	9,809
1938	7,461	6,589	11.7	2,956	9,545
1939	7,754	6,493	16.3	2,872	9,365
1940	7,926	6,291	20.7	2,866	9,157
1941	7,539	6,057	19.7	2,762	8,819
1942	7,223	6,120	15.4	2,469	8,589
1943	8,403	7,489	10.9	2,340	9,829
1944	6,817	6,011	11.8	2,596	8,607
1945	5,930	5,343	9.9	3,622	8,965
1946	7,610	6,856	9.9	9,669	16,525
1947	7,164	6,414	10.5	7,701	14,115
1948	6,624	5,904	10.8	7,595	13,499
1949	5,963	5,219	12.5	6,929	12,148
1950	6,203	5,481	11.6	6,755	12,236

TABLE 26.—*Graduates of Approved Schools and Others Registered, 1922-1950*

Year	Graduates of Approved Schools		Others		Totals
	Number	Per Cent of Total	Number	Per Cent of Total	
1922	4,519	80.5	1,093	19.5	5,612
1923	5,196	80.8	1,237	19.2	6,433
1924	5,687	85.1	992	14.9	6,679
1925	6,314	86.4	997	13.6	7,311
1926	6,441	88.7	828	11.3	7,269
1927	6,410	89.4	768	10.6	7,178
1928	6,585	90.1	733	9.9	7,318
1929	7,003	91.0	699	9.0	7,702
1930	7,011	92.1	610	7.9	7,621
1931	6,932	92.8	544	7.2	7,476
1932	6,676	92.1	457	6.3	7,133
1933	6,774	93.7	459	6.3	7,233
1934	7,172	92.1	617	7.9	7,789
1935	7,360	91.3	693	8.5	8,053
1936	7,934	88.1	1,063	11.8	8,997
1937	8,391	85.5	1,418	14.4	9,809
1938	8,315	87.1	1,230	12.9	9,545
1939	8,067	86.2	1,298	13.8	9,365
1940	7,781	85.0	1,376	15.0	9,157
1941	7,770	87.9	1,049	11.9	8,819
1942	7,290	84.9	1,299	15.1	8,589
1943	8,640	87.9	1,189	12.2	9,829
1944	7,737	89.8	870	10.1	8,607
1945	8,233	91.8	732	8.1	8,965
1946	15,692	94.9	835	5.1	16,527
1947	13,097	93.0	1,018	7.0	14,115
1948	12,791	94.8	708	5.2	13,499
1949	11,378	93.7	770	6.3	12,148
1950	11,502	94.0	734	6.0	12,236
Totals	234,098	89.9	26,316	10.1	261,014

approved by the board can be admitted to an examination in pharmacology, therapeutics and surgery and, if successful, can obtain a license to practice medicine and surgery. Since 1941 all osteopathic applicants who have met the requirements of the medical practice act have been licensed to practice medicine and surgery.

In New York a law approved April 10, 1946 provides that any osteopathic licentiate who had obtained the additional right to use instruments for minor surgical procedures and to use anesthetics, antiseptics, narcotics and biologic products or any applicant who has met or shall meet all the preliminary and professional requirements as required as of September 1, 1936 and has satisfactorily passed or shall satisfactorily pass the regular licensing examination shall be granted the right to practice medicine without limitation as defined by the statutes of the State of New York.

A law passed in Ohio in 1943 gives osteopaths who obtain their licenses under that act the right to practice osteopathic medicine and surgery. In Oregon they are granted the right to practice "in the subjects" covered by the examination, which includes surgery. In South Dakota osteopaths may be registered to practice surgery.

TABLE 27.—*Graduates of Unapproved Medical Schools Registered, 1945-1950*

	Examination						Reciprocity and Endorsement						Totals
	1945	1946	1947	1948	1949	1950	1945	1946	1947	1948	1949	1950	
Arizona	0	0	0	0	0	0	0	2	0	1	1	0	4
Arkansas	0	0	0	0	0	1	0	0	0	0	0	0	1
California	0	0	0	0	0	2	4	0	0	0	0	5	11
Dist. of Columbia	0	0	0	0	0	0	0	0	0	0	0	1	1
Florida	0	1	11	25	25	16	0	0	0	0	0	0	78
Georgia	0	0	0	0	1	1	0	0	0	0	3	0	5
Illinois	115	45	54	56	41	5	0	1	0	1	0	0	318
Iowa	0	1	0	0	0	0	0	1	0	0	0	0	2
Kentucky	0	0	2	0	2	0	0	0	0	0	0	0	4
Maine	0	0	0	0	0	0	0	0	0	0	2	1	3
Massachusetts	38	24	37	26	11	5	0	0	0	0	0	0	141
Michigan	0	0	0	0	0	0	0	0	0	0	0	1	1
Mississippi	0	4	0	3	0	1	0	0	0	0	0	0	8
Missouri	0	0	0	0	0	0	1	0	0	0	0	3	4
Nebraska	0	0	0	0	0	0	0	1	0	1	0	0	2
Nevada	0	0	0	0	0	0	2	0	0	0	0	0	2
New Hampshire	0	0	1	0	0	0	1	0	0	0	0	0	2
New Mexico	0	0	1	0	0	0	1	0	0	0	0	0	2
New York	0	111	132	60	94	7	0	0	0	0	0	0	404
North Carolina	0	0	0	0	0	3	0	0	0	0	0	0	3
Ohio	0	6	4	1	1	1	0	0	0	0	0	0	13
Pennsylvania	0	0	0	0	0	1	0	0	0	0	0	0	1
Tennessee	0	0	0	0	0	0	0	0	0	0	1	0	1
Texas	0	0	0	0	0	0	0	1	0	0	0	2	3
Virginia	3	10	4	1	3	0	0	1	0	0	0	0	22
Washington	0	2	4	1	1	0	0	0	0	0	0	0	8
West Virginia	0	0	0	0	2	0	0	0	0	0	0	0	2
Wisconsin	0	0	0	0	0	0	1	0	0	0	0	0	1
Alaska	0	0	0	0	1	0	0	0	0	0	0	0	1
Hawaii	0	0	0	0	2	2	0	0	0	0	0	0	4
Totals	156	204	250	173	184	45	10	7	0	3	7	13	1,052

TABLE 28.—*Graduates of Schools of Osteopathy Registered by Medical Boards, 1945-1950*

	Examination						Reciprocity and Endorsement						Totals
	1945	1946	1947	1948	1949	1950	1945	1946	1947	1948	1949	1950	
Alabama	0	0	1	0	0	0	0	0	0	0	0	0	1
Colorado	7	5	11	5	5	8	0	0	0	0	0	0	41
Connecticut	2	5	3	0	1	4	0	0	0	0	0	0	15
Delaware	0	0	0	0	0	0	0	4	0	0	1	0	5
Dist. of Columbia	0	0	0	0	0	1	1	1	1	2	1	1	8
Indiana	0	43	0	0	3	3	7	7	0	0	1	0	64
Massachusetts	5	0	2	2	0	0	0	2	1	5	3	3	23
Nebraska	2	0	1	0	1	0	0	0	0	0	0	0	4
New Hampshire	0	0	0	0	0	0	0	0	3	6	4	1	14
New Jersey	15	9	9	3	5	7	0	0	2	3	1	2	56
New York	0	5	134	34	11	34	0	0	75	13	2	3	311
Ohio	48	47	12	21	24	28	1	7	10	12	4	8	222
Oregon	0	0	0	1	0	0	14	12	16	8	5	0	56
South Dakota	0	0	0	0	0	1	0	0	0	0	0	1	2
Texas	20	42	38	33	15	35	1	0	0	1	9	5	200
Virginia	0	1	0	1	0	1	0	0	0	1	0	0	4
Wisconsin	1	1	3	2	1	4	15	11	3	6	1	0	48
Wyoming	0	0	0	0	0	0	0	1	0	0	0	1	2
Totals	100	158	214	102	66	126	39	45	111	57	32	25	1,084

The medical practice act of Texas provides for the issuing of a license to practice medicine only, and osteopaths are issued licenses unrestricted in scope. In Virginia osteopaths may obtain the right to use drugs and perform surgery with the use of instruments if they satisfy the board of medical examiners that they are qualified to do so. The Wisconsin law pertaining to the licensing of doctors of osteopathy was amended in 1950 and provides that an osteopath licensed in Wisconsin may obtain a license to practice medicine and surgery by (a) completing a refresher course in materia medica and pharmacology consisting of not less than 64 hours of lecture and 60 hours of laboratory work and (b) by passing an examination given by the board in those two subjects. In the future osteopaths will be given the same examination as physicians and if successful will be granted licenses to practice medicine and surgery. In Wyoming the statutes contain no specific provision for the licensing of osteopaths. The medical practice act of the latter state provides that the certificate issued to all applicants "shall be deemed licenses to practice medicine in all branches in which the applicant has taken examination in the state."

TABLE 29.—*Foreign Medical Schools*

List Prepared by the Council on Medical Education and Hospitals of the American Medical Association and the Executive Council of the Association of American Medical Colleges

On the basis of information presently available, the Council on Medical Education and Hospitals of the American Medical Association and the Executive Council of the Association of American Medical Colleges are of the opinion that medical institutions and medical organizations in the United States would be justified in considering current and past graduates of the following foreign medical schools on the same basis that they consider graduates of approved medical schools in the United States. This list is not final and will be supplemented as information is compiled for other schools.

Belgium

Free University of Brussels Faculty of Medicine
(Université Libré de Bruxelles Faculté de Medicine)

Catholic University of Louvain Faculty of Medicine
(Université Catholique de Louvain Faculté de Medicine or
Katholieke Universiteit te Leuven)

University of Ghent Faculty of Medicine
(Universiteit te Gent Faculteit der Geneeskunde, or
Université de Gand Faculté de Médecine)

University of Liege Faculty of Medicine
(Université de Liége Faculté de Medicine)

Brazil

University of Sao Paulo Faculty of Medicine
(Universidade de Sao Paulo Faculdade de Medicina)

Denmark

University of Copenhagen Faculty of Medicine
(Kobenhavns Universitet Laegevidenskabelige Fakultet)

Finland

University of Helsinki Faculty of Medicine
(Helsingfors Universitet Medicinska Fakulteten)

Medical Faculty Turku University
(Turun Yliopiston Laaketieteellinen Tiedekunta)

Lebanon

American University of Beirut School of Medicine

Netherlands

University of Amsterdam Faculty of Medicine
(Universiteit van Amsterdam Geneeskunde Faculteit)

State University of Groningen Faculty of Medicine
(Rijks-Universiteit te Groningen Medische Faculteit)

State University of Leiden Faculty of Medicine
(Rijks-Universiteit te Leiden Faculteit der Geneeskunde)

State University of Utrecht Faculty of Medicine
(Rijks-Universiteit te Utrecht Faculteit der Geneeskunde)

Norway

University of Oslo Faculty of Medicine
(Kongelige Frederiks Universitet Medisinske Fakultet)

Sweden

Royal Charles University Medical Faculty, Lund
(Kungl. Karolinska Universitetet Medicinska Fakulteten)

Charles Medico-Surgical Institute, Stockholm
(Karolinska Mediko-Kirurgiska Institutet)

Royal University of Uppsala Medical Faculty
(Kungl. Universitetet I Uppsala Medicinska Fakulteten)

Switzerland

The recommendation with respect to the following medical schools in Switzerland applies only to those graduates of Swiss medical schools who hold the Swiss Federal Diploma issued by the Federal Department of the Interior (Eidgendoissisches Departement Des Innern, Departement Federal de L'Interieur) and obtainable only by Swiss citizens, or who hold the Certificate of Medical Studies (Akademische Zeugnis, Certificat d'Etudes Medicales) which is issued by the Departments of Education of the cantonal government and which is awarded to those not citizens of Switzerland who complete a course of study and pass examinations equivalent to those taken by Swiss citizens in qualifying for the Swiss Federal Diploma.

The recommendation does not apply to those holding only the M.D. degree from Swiss universities or those who have taken only faculty examinations and hold certificates other than the Swiss Federal Diploma of its equivalents: the Akademische Zeugnis or Certificat d'Etudes Medicales. The M.D. degree in Switzerland is frequently awarded on the basis of a thesis written during as little as one year in residence. Faculty diplomas may be issued to students who have not completed the full course of study and who have not passed the examinations required for the Swiss Federal Diploma or its equivalent.

Officials of State Boards and of other organizations who are in doubt as to the nature of credentials presented by individual graduates of Swiss schools are urged to communicate with the Director of the Schweizerisches Gesundheitsamt, Bern, Switzerland.

University of Basel Faculty of Medicine
(Universität Basel Medizinische Fakultät)

University of Bern Faculty of Medicine
(Universität Bern Medizinische Fakultät)

University of Geneve Faculty of Medicine
(Université de Genève Faculté de Medecine)

University of Lausanne Faculty of Medicine
(Université de Lausanne Faculté de Medecine)

University of Zurich Faculty of Medicine
(Universität Zurich Medizinische Fakultät)

United Kingdom

The recommendation applies only to those physicians trained in the United Kingdom who hold medical degrees from the universities listed. The recommendation does not apply to those physicians who received their medical training at these universities or their affiliated hospital medical schools but who did not complete the work for the degree and who obtained their qualifications only through the examinations of the licensing corporations of the United Kingdom.

England

University of Birmingham Faculty of Medicine
University of Bristol Faculty of Medicine
University of Cambridge Faculty of Medicine
University of Durham Medical School, Newcastle-upon-Tyne
University of Leeds Faculty of Medicine
University of Liverpool Faculty of Medicine
University of London†
University of Manchester Faculty of Medicine
University of Oxford Faculty of Medicine
University of Sheffield Faculty of Medicine

Northern Ireland

Queen's University of Belfast Faculty of Medicine

Scotland

University of Aberdeen Faculty of Medicine
University of Edinburgh Faculty of Medicine
University of Glasgow Faculty of Medicine
University of St. Andrews Medical School, St. Andrews and Dundee.

Wales

Welsh National School of Medicine, University of Wales, Cardiff

† Work for the medical degree of the University of London is offered at the following hospital medical schools:

Charing Cross Hospital Medical School
Guy's Hospital Medical School
King's College Hospital Medical School
London Hospital Medical School
Middlesex Hospital Medical School
Royal Free Hospital School of Medicine
St. Bartholomew's Hospital Medical School
St. George's Hospital Medical School
St. Mary's Hospital Medical School
St. Thomas' Hospital Medical School
University College Hospital Medical School
Westminster Hospital Medical School

Licensure of Foreign Trained Physicians

In 1947 an advisory committee was formed at the instigation of the Council on Medical Education and Hospitals to assist in studying the problem of physicians trained in foreign medical schools who desire to come

Marginal Number	SCHOOL	Alabama P	Alabama F	Arkansas P	Arkansas F	California P	California F	Connecticut P	Connecticut F	Dist. of Columbia P	Dist. of Columbia F	Florida P	Florida F	Georgia P	Georgia F	Illinois P	Illinois F	Indiana P	Indiana F	Iowa P	Iowa F	Kansas P	Kansas F	Maine P	Maine F	Maryland P	Maryland F
	ALGERIA																										
1	Ecole de Plein Exercice de Medecine de Pharmacie, Alger	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	ARGENTINA																										
2	Universidad Nacional de Buenos Aires	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..	1	0
	AUSTRIA																										
3	Karl-Franzens-Universität, Graz	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0	1	..	..	..	..	..	..	..	..	..	..
4	Leopold Franzens-Universität, Innsbruck	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0	1	..	..	..	..	..	..	..	..	..	..
5	Universität Wien	..	..	..	..	2	1	..	..	..	..	..	..	..	..	0	2	..	..	..	..	..	..	..	..	1	0
	AUSTRALIA																										
6	University of Sydney	..	..	..	..	1	0	..	..	..	..	..	..	..	..	0	1	..	..	..	..	..	..	..	..	..	..
	BELGIUM																										
7	Université de Ghent	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
8	Université de Liege	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..
9	Université de Louvain	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	BRAZIL																										
10	Faculdade de Medicina Cirurgia e Pharmacia, Bahia	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..
11	Universidade de Sao Paulo Faculdade de Medicina	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	CHILE																										
12	Universidad de Chile, Santiago	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	CHINA																										
13	Peiping Union Medical College	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
14	Pennsylvania Medical School, Shanghai	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
15	Aurora University, Shanghai	..	..	..	..	1	0	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
16	Cheeloo University, Shantung	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0	1
17	Hsiang Yu Medical College, Canton	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
18	St. John's University, Shanghai	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
19	University of Lingnan, Canton	..	..	..	..	0	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	COLOMBIA																										
20	Universidad de Antioquia, Medellin	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	CUBA																										
21	Universidad de la Habana	..	..	..	..	0	2	..	..	..	..	2	1	1	0	8	12	1	0	..	..	..	..	..	..	..	..
	CZECHOSLOVAKIA																										
22	Univerzita Komenského, Bratislava	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..
23	Masarykova Universita, Brno	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1	..	..	..	..	..	..	..	..	1	0
24	Deutsche Universität, Prague	1	0	..	..	0	1	0	2	..	..	..	..	..	..	1	1	..	..	..	..	..	..	..	..	1	0
25	Universität Karlova, Praha	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	DENMARK																										
26	Kobenhavns Universitet	..	..	..	..	..	..	0	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	DOMINICAN REPUBLIC																										
27	Universidad de Santo Domingo	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	ECUADOR																										
28	Universidad Central, Quita	..	..	..	..	..	..	..	..	0	1	..	..	..	..	0	1	..	..	..	..	..	..	..	..	..	..
	EL SALVADOR																										
29	Universidad de El Salvador	..	..	..	..	3	1	..	..	..	..	..	..	..	..	0	1	..	..	..	..	..	..	..	..	..	..
	ENGLAND																										
30	University of Durham (Kings College)	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
31	University of Liverpool	..	..	..	..	1	0	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
32	University of London	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
33	University of Manchester	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
34	University of Oxford	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
35	Licentiate of the Royal College of Physicians of London and Member of the Royal College of Surgeons of England	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0
36	Licentiate in Medicine, Surgery and Midwifery of the Apothecaries' Society of London	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	ESTONIA																										
37	Tartu Ulikooli	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	FINLAND																										
38	Helsingfors Universitet	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0	1	..	..	..	..	..	..	..	..	..	..
	FRANCE																										
39	Université d'Aix-Marseille	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
40	Université de Montpellier	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..
41	Université de Nancy	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
42	Université de Paris	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
43	Université de Strasbourg	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0
	GERMANY																										
44	Friedrich-Wilhelms-Universität, Berlin	..	..	..	..	1	0	0	1	..	..	..	..	..	..	2	1	..	..	..	..	..	..	..	..	..	..
45	Rhenische Friedrich-Wilhelms-Universität, Bonn	..	..	..	..	1	0	..	..	..	..	..	..	..	..	0	1	..	..	..	..	..	..	..	..	..	..
46	Schlesische-Friedrich-Wilhelms-Universität, Breslau	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	0	..	..	..	..	..	..	..	..	..	..
47	Johann Wolfgang Goethe-Universität, Frankfurt-am-Main	..	..	..	..	2	0	..	..	..	..	1	0	..	..	1	0	..	..	..	..	..	..	..	..	..	..
48	Friedrich-Alexanders-Universität, Erlangen	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	0
49	Albert-Ludwigs-Universität, Freiburg	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
50	Hessische Ludwigs-Universität, Giessen	..	..	..	..	1	0	..	..	..	..	..	..	..	..	0	1	..	..	..	..	1	1	..	..	..	..
51	Hamburgische Universität	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..
52	Universität-Heidelberg	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
53	Thuringische Landesuniversität, Jena	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..
54	Christian-Albrechts-Universität, Kiel	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
55	Universität-Köln	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..
56	Albertus-Universität, Konigsberg	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
57	Universität Leipzig	..	..	..	..	1	0	..	..	..	..	..	..	..	..	1	1	..	..	..	..	..	..	..	..	..	..
58	Ludwig-Maximillians-Universität, München	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
59	Universität-Rostock	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0	2	..	..	..	..	..	..	..	..	..	..
60	Eberhard-Karls-Universität, Tubingen	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
61	Julius-Maximilians-Universität, Wurzburg	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
62	Universität Wien	..	..	..	..	..	..	0	3	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	GREECE																										
63	National University of Athens	..	..	..	..	..	..	..	..	..	..	1	0	..	..	1	2	..	..	..	..	..	..	..	..	..	..
	HAITI																										
64	Ecole Nationale de Medecine, Port-au-Prince	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0	1	..	..	..	..	..	..	..	..	..	..
	HONDURAS																										
65	University of Honduras	..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..
	HUNGARY																										
66	Magyar Királyi Pázmány Petrus Tudományegyetum, Budapest	..	..	..	..	3	0	..	..	1	0	..	..	..	..	2	0	..	..	..	..	..	..	..	..	..	..
67	Magyar Királyi Tisza-István Tudományegyetum, Debrecen	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0	1	..	..	..	..	..	..	..	..	..	..
68	Magyar Királyi Erzébet Tudományegyetem, Pecs	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0	1	..	..	..	..	..	..	..	..	..	..
69	Magyar Királyi Ferencz Jozsef Tudományegyetem, Szeged	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0	1
	ICELAND																										
70	Haskoli Islands lae Knadeildin, Reykjavik	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	IRAN																										
71	Madresseh Teb, Teheran	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	IRAQ																										
72	Royal Iraq Medical College, Bagdad	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..

Maryland		Massachusetts		Michigan		Minnesota		Missouri		New Hampshire		New Jersey		New York		North Carolina		North Dakota		Ohio		Oklahoma		Pennsylvania		Rhode Island		South Carolina		South Dakota		Texas		Virginia		Washington		U. S. Territories and Possessions		Totals	Examined—Passed	Examined—Failed	Percentage Failed	Number of Boards Examined by	Marginal Number
P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F						
														0	1																							1	0	1	100.0	1	1
1	0																																					2	2	0	0.0	2	2
														0	3																							4	0	4	100.0	2	3
		0	1											1	0																							3	1	2	66.7	3	4
1	0					1	0							12	27					2	1			2	0	1	0	1	0					1	0			54	23	31	57.4	10	5
																																						1	1	0	0.0	1	6
														0	1																							1	0	1	100.0	1	7
														1	2																							3	1	2	66.7	1	8
																																						1	1	0	0.0	1	9
																				1	0																	1	1	0	0.0	1	10
																																						1	1	0	0.0	1	11
														1	0																							1	1	0	0.0	1	12
														1	0																							1	1	0	0.0	1	13
												0	1	0	2																							3	0	3	100.0	2	14
														0	1																							2	2	0	0.0	2	15
0	1																																			1	0	2	1	1	50.0	2	16
																																				1	0	1	100.0	1	17
																																				1	0	2	0	0.0	2	18
														0	1																							1	0	1	100.0	1	19
														0	1																							1	0	1	100.0	1	20
1	1					1	0							2	2	1	0									0	1			0	1							37	17	20	54.0	11	21
														3	2					1	0																	6	4	2	33.3	2	22
0	1													4	15					1	0																	22	8	20	71.4	8	23
1	0													3	10					1	1																	18	6	12	66.7	4	24
						1	0																											1	0			3	2	1	33.3	3	25
														0	2																							2	0	2	100.0	1	26
																																						2	0	2	100.0	2	27
														1	0																							6	4	2	33.3	3	28
														1	0																							2	2	0	0.0	2	29
																																						2	2	0	0.0	2	30
														2	0																							2	2	0	0.0	2	31
																																						2	2	0	0.0	1	32
																1	0																					1	1	0	0.0	1	33
																																						1	1	0	0.0	1	34
1	0					1	0							2	5	1	0			1	0													1	0			14	9	5	35.7	8	35
														0	1																							1	0	1	100.0	1	36
0	1													1	0			1	0																	2	0	5	4	1	20.0	4	37
0	1			1	0									1	1																							5	2	3	60.0	4	38
														0	1																							1	1	0	0.0	1	39
														0	1																							2	1	1	50.0	2	40
														2	0																							1	0	1	100.0	1	41
														0	1																							4	2	2	50.0	1	42
1	0																																					1	0	1	100.0	1	43
														6	14					1	2									1	0	1	0					31	13	18	58.1	8	44
0	1													1	1																							4	2	2	50.0	3	45
														2	4																							9	4	5	55.6	3	46
														1	3																							8	5	3	37.5	4	47
				1	0									0	2																							2	0	2	100.0	1	48
2	0													1	1	0	1																					6	4	2	33.3	4	49
														1	0																							2	2	0	0.0	2	50
														1	2																							7	2	5	71.4	4	51
														1	1			1	0	1	1																	6	4	2	33.3	4	52
														1	2																							3	1	2	66.7	1	53
														2	1																							1	1	0	0.0	1	54
														0	2																							3	2	1	33.3	1	55
														0	2					0	1																	3	1	2	66.7	2	56
														0	5					1	0									1	1							3	0	3	100.0	2	57
														0	2					1	0																	11	4	7	63.6	5	58
														1	1					1	0									1	0							3	1	2	66.7	2	59
																																						4	2	2	50.0	3	60
																1	0																					2	1	1	50.0	1	61
								0	1			1	5							1	1																	4	1	3	75.0	2	62
																																						13	4	9	69.2	5	63
																																						1	0	1	100.0	1	64
0	1																																					1	1	0	0.0	1	65
														1	6			0	1	1	1									0	1							18	8	10	55.6	8	66
														0	3																							4	0	4	100.0	2	67
														3	4					0	1																	9	3	6	66.7	3	68
				1	0									1	2																							4	1	3	75.0	2	69
																																						1	1	0	0.0	1	70
														4	2																							6	4	2	33.3	1	71
																																						1	1	0	0.0	1	72

Marginal Number	SCHOOL	Alabama P	Alabama F	Arkansas P	Arkansas F	California P	California F	Connecticut P	Connecticut F	Dist. of Columbia P	Dist. of Columbia F	Florida P	Florida F	Georgia P	Georgia F	Illinois P	Illinois F	Indiana P	Indiana F	Iowa P	Iowa F	Kansas P	Kansas F	Maine P	Maine F	Maryland P	Maryland F
	IRELAND																										
73	National University of Ireland	..	..	..	..	2	0	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..	4	0
74	University of Dublin	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..
75	Queen's University, Belfast	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
76	Licentiate of the Royal College of Physicians and Licentiate of the Royal College of Surgeons, Ireland	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
77	Licentiate of the Apothecaries' Hall, Dublin	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	ITALY																										
78	Regia Università di Bari	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
79	Regia Università di Bologna	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
80	Regia Università di Catania	..	..	..	..	0	1	0	1	..	..	..	..	..	..	0	1	..	..	..	..	..	..	0	1	0	1
81	Regia Università di Firenze	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
82	Regia Università di Genova	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
83	Regia Università di Messina	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..
84	Regia Università di Milano	..	..	..	..	0	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
85	Regia Università di Modena	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
86	Regia Università di Napoli	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
87	Regia Università di Padova	..	..	..	..	..	..	0	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
88	Regia Università di Pavia	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0	1	..	..	..	..	..	..	..	..	..	..
89	Regia Università di Palermo	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
90	Regia Università di Pisa	..	..	..	..	2	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
91	Regia Università di Roma	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0	1	..	..	..	..	..	..	..	..	..	..
92	Regia Università di Siena	..	..	..	..	1	1	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	1	0
93	Regia Università di Torino	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	JAPAN																										
94	Osaka Imperial University	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
95	Tokyo Charity Association Medical College	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	LATVIA																										
96	University of Riga	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	LEBANON																										
97	American University of Beirut	..	..	..	..	..	..	2	0	1	0	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..
	LITHUANIA																										
98	Vytauto Didziojo Universiteto, Kaunas	..	..	..	..	1	0	..	..	..	..	..	..	..	..	5	8	..	..	..	..	..	..	..	..	0	3
	MANCHUKUO																										
99	Mukden Medical College	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	MEXICO																										
100	Universidad de Guadalajara	..	..	..	..	0	3	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
101	Universidad Nacional, Mexico City	..	..	..	..	4	3	2	1	..	..	..	..	..	..	3	3	..	..	..	..	..	..	..	..	..	..
102	Escuela de Medicine, Oaxaca	..	..	..	..	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
103	Escuela de Medicine de Nuevo Leon, Monterrey	..	..	..	..	1	0	..	..	..	..	1	0	..	..	0	1	..	..	..	..	..	..	..	..	..	..
	NETHERLANDS																										
104	Universiteit van Amsterdam	..	..	..	..	1	0	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
105	Rijks-Universiteit te Leiden	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
106	Rijks-Universiteit te Utrecht	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	NICARAGUA																										
107	Universidad de Nicaragua, Leon y en Granada	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..
	NORWAY																										
108	Universitet Oslo	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	PERU																										
109	Universidad Mayor de San Marcos	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	PHILIPPINES																										
110	University of Santo Tomas, Manila	..	..	..	..	0	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
111	University of Philippines, Manila	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	POLAND																										
112	Uniwersytet Jagiellónski, Cracow	..	..	..	..	..	..	..	..	..	..	..	..	..	..	3	1	..	..	..	..	..	..	..	..	..	..
113	Marie Curie Uniwersytet, Lublan	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
114	Uniwersytet Jana Kazimierza, Lwow	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1
115	Uniwersytet Poznánski, Poznán	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0	1	..	..	..	..	..	..	..	..	..	..
116	Uniwersytet Jozefa Pilsudskiégo, Warszawa	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1	..	..	..	..	..	..	..	..	1	0
117	Uniwersytet Stefana Batorego, Wilno	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	PORTUGAL																										
118	University of Lisbon	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	RUMANIA																										
119	Universitatea din Bucuresti	..	..	..	..	..	..	..	..	0	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0	1
120	Universitatea din Cluj	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	SCOTLAND																										
121	University of Aberdeen	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
122	University of Edinburgh	..	..	..	..	2	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
123	University of Glasgow	..	..	..	..	..	..	1	0	1	0	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..
124	Licentiate of the Royal College of Physicians and Surgeons of Edinburgh, and Licentiate of the Royal Faculty of Physicians and Surgeons of Glasgow	..	..	..	..	..	..	..	..	..	..	0	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	SOUTH AFRICA																										
125	University of Witwatersrand, Johannesburg	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	SPAIN																										
126	Universidad de Barcelona	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0	1	..	..	..	..	..	..	..	..	..	..
127	Universidad de Salamanca	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..
128	Universidad de Valencia	..	..	..	..	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
129	Universidad de Zaragoza	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	SWEDEN																										
130	Medico-Surgico Institute, Stockholm	..	..	..	..	0	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	SWITZERLAND																										
131	Universitäte Basel	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1	..	..	..	..	..	..	..	..	1	0
132	Universitäte Bern	..	..	..	..	1	1	..	..	..	..	..	..	..	..	0	1	..	..	..	..	..	..	..	..	..	..
133	Université de Genève	..	..	..	..	2	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
134	Université de Lausanne	..	..	1	0	..	..	0	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
135	Universität Zurich	..	..	..	..	1	0	2	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0
	UNION OF SOCIALIST SOVIET REPUBLICS																										
136	University Baku	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
137	Second Moscow Medical Institute	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
138	University of Moscow	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
139	University of Kazan	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
140	University of Odessa	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
141	Severo-Kayka Medical Institute, Rostov-on-the-Don	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	VENEZUELA																										
142	University of Caracas	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	YUGOSLAVIA																										
143	Beogradskog Universiteta	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..
144	Zagrebaskog Universiteta	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0	1	..	..	..	..	..	..	..	..	..	..
	Totals	1	1	69	20	8	11	2	109	1	1	2	1	25													
	Totals—Examined—Passed	1	1	47	9	6	9	2	46	1	1	1	0	17													
	Totals—Examined—Failed	0	0	22	11	2	2	0	54	0	0	1	1	8													
	Percentage Failed	0.0	0.0	31.9	55.0	25	182	0.0	54.0	0.0	0.0	50.0	100.0	32.0													

Massachusetts		Michigan		Minnesota		Missouri		New Hampshire		New Jersey		New York		North Carolina		North Dakota		Ohio		Oklahoma		Pennsylvania		Rhode Island		South Carolina		South Dakota		Texas		Virginia		Washington		U. S. Territories and Possessions		Totals	Examined—Passed	Examined—Failed	Percentage Failed	Number of Boards Examined by	Marginal Number
P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F						
..	..	..	..	..	..	..	..	..	..	..	..	5	5	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	17	12	5	29.4	4	73
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	2	0	0.0	2	74
..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1	0	0.0	1	75
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1	0	0.0	1	76
..	..	..	..	..	..	..	..	..	..	..	..	0	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	1	100.0	1	77
..	..	..	..	..	..	..	..	..	..	..	..	0	3	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	3	0	3	100.0	1	78
0	1	..	..	..	..	..	..	..	..	0	2	4	15	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	27	4	23	85.2	8	79
..	..	..	..	..	..	..	..	..	..	..	..	0	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	0	2	100.0	1	80
..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	2	0	0.0	2	81
..	..	..	..	..	..	..	..	..	..	..	..	0	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	1	1	50.0	2	82
..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	0	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	3	1	2	66.7	3	83
..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1	0	0.0	1	84
..	..	..	..	..	..	..	..	..	..	..	..	0	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	1	100.0	1	85
0	2	..	..	..	..	..	..	..	..	..	..	5	8	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	16	5	11	68.8	3	86
..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..	0	1	..	..	..	..	..	..	..	..	..	..	..	..	3	1	2	66.7	3	87
..	..	..	..	..	..	..	..	..	..	..	..	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	3	2	1	33.3	2	88
..	..	..	..	..	..	..	..	..	..	..	..	0	3	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	7	2	5	71.4	2	89
..	..	..	..	..	..	..	..	..	..	..	..	0	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	3	0	3	100.0	2	90
0	2	..	..	..	..	..	..	..	..	1	1	4	5	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	17	8	9	52.9	6	91
..	..	..	..	..	..	..	..	..	..	..	..	0	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	1	100.0	1	92
..	..	..	..	..	..	..	..	..	..	..	..	0	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	1	1	50.0	2	93
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1	0	0.0	1	94
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1	1	50.0	1	95
..	..	..	..	..	..	..	..	..	..	..	..	0	5	..	..	..	..	2	0	..	..	..	..	..	..	..	..	..	..	2	0	..	..	..	..	10	5	5	50.0	4	96
..	..	..	..	..	..	..	..	..	..	..	..	2	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	8	6	2	25.0	4	97
..	..	..	..	..	..	..	..	..	..	..	..	2	8	..	..	..	..	7	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	35	15	20	57.1	5	98
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1	0	0.0	1	99
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	3	0	3	100.0	1	100
0	1	..	..	..	..	..	..	..	..	..	..	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	22	13	9	40.9	7	101
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	1	1	50.0	1	102
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	3	2	1	33.3	3	103
..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	3	3	0	0.0	3	104
..	..	..	..	..	..	..	..	..	..	..	..	0	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	1	100.0	1	105
..	..	..	..	..	..	..	..	..	..	..	..	2	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	4	2	2	50.0	1	106
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1	0	0.0	1	107
..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	2	2	0	0.0	2	108
..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1	0	0.0	1	109
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	2	1	1	50.0	2	110
..	..	..	..	..	..	..	..	..	..	..	..	0	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	1	100.0	1	111
..	..	..	..	..	..	..	..	..	..	..	..	3	4	..	..	0	1	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	13	7	6	46.2	4	112
..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1	0	0.0	1	113
..	..	..	..	..	..	..	..	..	..	..	..	6	10	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	19	8	11	57.9	3	114
..	..	..	..	..	..	..	..	..	..	..	..	1	2	..	..	..	..	..	..	..	..	0	1	..	..	..	..	..	..	..	..	..	..	..	..	5	1	4	80.0	3	115
..	..	..	..	..	..	..	..	..	..	..	..	1	6	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	10	3	7	70.0	3	116
..	..	..	..	1	0	..	..	..	..	..	..	3	5	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	9	4	5	55.6	2	117
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1	0	0.0	1	118
..	..	..	..	..	..	..	..	..	..	..	..	0	3	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	5	0	5	100.0	3	119
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	1	1	50.0	2	120
..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	2	0	0.0	2	121
..	..	1	0	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	4	4	0	0.0	3	122
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	3	3	0	0.0	3	123
..	..	..	..	..	..	..	..	..	..	0	1	5	11	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	19	6	13	68.4	4	124
..	..	..	..	..	..	..	..	..	..	..	..	2	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	3	2	1	33.3	1	125
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	1	100.0	1	126
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1	0	0.0	1	127
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	1	1	50.0	1	128
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	1	1	0	0.0	1	129
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	1	100.0	1	130
..	..	..	..	..	..	..	..	..	..	..	..	2	5	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	10	4	6	60.0	3	131
..	..	..	..	1	0	..	..	..	..	..	..	4	5	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	13	6	7	53.8	4	132
..	..	..	..	..	..	..	..	..	..	..	..	3	8	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	13	5	8	61.5	2	133
0	2	..	..	..	..	..	..	..	..	..	..	2	4	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	10	3	7	70.0	4	134
..	..	..	..	..	..	..	..	..	..	..	..	7	7	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	19	12	7	36.8	5	135
..	..	..	..	..	..	..	..	..	..	..	..	0	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	1	100.0	1	136
..	..	..	..	..	..	..	..	..	..	..	..	0	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	1	100.0	1	137
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	1	100.0	1	138
..	..	..	..	..	..	..	..	..	..	..	..	0	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	1	100.0	1	139
..	..	..	..	..	..	..	..	..	..	..	..	0	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	1	100.0	1	140
..	..	..	..	..	..	..	..	..	..	..	..	0	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	1	100.0	1	141
0	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	1	100.0	1	142
..	..	..	..	..	..	..	..	..	..	..	..	1	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	4	2	2	50.0	2	143
..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	1	1	50.0	2	144
18		1		9		2		1		8		433		6		6		38		1		4		2		1		5		7		2		3		10		799	..	..	....	..	
2		1		9		2		0		2		140		5		4		25		1		2		1		1		5		4		2		3		9		..	359	..	....	..	
16		0		0		0		1		6		293		1		2		13		0		2		1		0		0		3		0		0		1		..	..	440	....	..	
88.9		0.0		0.0		0.0		100.0		75.0		67.7		16.7		33.3		34.2		0.0		50.0		50.0		0.0		0.0		42.9		0.0		0.0		10.0		..	..	..	55.0	..	

to the United States and establish a medical practice. Eighteen organizations and governmental agencies, in addition to the Council, are represented on the committee. In 1949 the committee recommended that the Council, in collaboration with the Association of American Medical Colleges, give consideration to the preparation of a limited listing of foreign medical schools. On the basis of data already in the Council's files, published reports, personal reports from American physicians who have visited foreign medical schools and the records of the

TABLE 31.—*Requirements of Candidates for Medical Licensure on the Basis of Credentials Obtained in Countries Other Than the United States and Canada*

	Admitted to Examination	Admitted by Endorsement of State License [a]	Citizenship	Basic Science Certificate	Internship or Residency in Hospital in United States	Further Medical Training	Examination Fee, Dollars	Footnotes
Alabama	x	..	x	..	x	..	10	1
Arizona	Not accepted [33]							
Arkansas	Not accepted							
California	x	x	x	..	x	x	25	2
Colorado	x	..	x	x	x	x	25	7, 8, 25
Connecticut	x	x	1st P	x	..	..	25	3, 28
Delaware	x	..	x	..	x	..	25	4
District of Columbia	x	x	..	x	x	..	25	5, 28
Florida	x	..	x	x	..	..	25	6, 24
Georgia	x	x	x	..	..	..	20	24
Idaho	Not accepted							
Illinois	x	..	1st P	..	x	..	15	..
Indiana	x	..	..	..	..	x	25	7
Iowa	x	..	x	x	x	x	25	8, 26
Kansas	x	..	x	..	x	..	25	9
Kentucky	Not accepted							
Louisiana	Not accepted							
Maine	Not accepted							
Maryland	x	..	1st P	..	x	..	20	26
Massachusetts	x	..	1st P	..	..	..	25	29
Michigan	x	..	..	x	x	x	25	7
Minnesota	x	..	1st P	x	x	..	20	12
Mississippi	x	..	x	..	x	..	10	13, 24
Missouri	x	..	x	..	x	..	15	12
Montana	Not accepted							
Nebraska	x	..	x	x	..	..	25	22, 28
Nevada	Not accepted							
New Hampshire	x	x	x	..	x	..	30	14, 28, 34
New Jersey	x	x	x	..	x	..	25	15
New Mexico	x	..	1st P	x	..	..	50	27
New York	x	x	1st P	..	..	..	25	16, 28
North Carolina	Not accepted							
North Dakota	x	..	x	..	x	x	25	11, 17, 31
Ohio	x	x	1st P [32]	..	..	..	25	28, 33
Oklahoma	Not accepted							
Oregon	x	..	x	x	x	..	25	24
Pennsylvania	x	..	1st P	..	x	..	25	19, 28
Rhode Island	x	..	1st P	x	x	x	20	20, 28
South Carolina	Not accepted							
South Dakota	x	..	1st P	x	x	..	20	28
Tennessee	x	..	x	x	..	..	25	24
Texas	x	..	..	x	x	..	25	21, 24
Utah	Not accepted							
Vermont	Not accepted [14]							
Virginia	x	..	1st P [23]	..	..	..	25	24
Washington	x	..	..	x	x	..	25	24
West Virginia	Not accepted							
Wisconsin	x	..	1st P	x	..	..	25	24
Wyoming	Not accepted							
Alaska	x	x	x	x	x	..	25	..
Guam	x	..	..	..	x	..	50	..
Hawaii	x	..	x	..	x	..	25	14, 24
Puerto Rico	x	x	x	..	x	..	30	..
Virgin Islands	x	..	..	..	x	..	65	24

This summary should be supplemented by direct communication with the secretary of the licensing board of the state in which the physician is interested.

x. Implies Yes.

[a] Refer to chart "Reciprocity and Endorsement Policies" for further data.

1. Candidate is eligible if his credentials have been appraised by the National Board of Medical Examiners and approved.

2. (a) Citizenship waived if country in which applicant is licensed will admit to licensure citizens of the United States. (b) Acceptable for reciprocal registration if license submitted was granted on same standards as in effect in California on the same date and upon completion of an oral, clinical and written examination. (c) Internship in United States satisfactory to the board or completion of senior year in approved medical school in the United States.

3. Graduates of medical schools outside of the United States, Canada or the British Isles subsequent to Jan. 1, 1940 not eligible.

4. Residence of one year in Delaware required.

5. (a) Acceptable for reciprocal registration if similar privileges are accorded licentiates of District of Columbia by licensing agency or jurisdiction from which the applicant comes. (b) Regulations cited refer also to graduates of Canadian schools.

6. Senior year in an approved medical school in the United States or Canada, possess the degree of Master of Public Health from an acceptable school, or satisfactorily complete a one year's assistant residency, residency or fellowship in an approved hospital in the United States accepted as further training.

7. Further training—Completion of senior year in approved medical school in the United States.

8. Further training—Internship or one year in medical school in the United States.

9. (a) Applicant must be licensed to practice medicine and surgery in country in which school of graduation is located, otherwise required to complete senior year in approved medical school in United States. (b) In lieu of internship, certificate from three graduates of the applicant's medical school licensed to practice medicine in United States accepted.

10. (a) Applicant must be licensed to practice medicine and surgery in country in which school of graduation is located, otherwise required to complete senior year in approved medical school in United States. (b) No applications accepted from countries other than England (certain schools), Ireland, Scotland and Australia.

11. Citizenship requirements waived for displaced physicians.

12. Credentials must be submitted in original form and accompanied by translation, and will be directly verified or documents should bear evidence of being visaed by the U. S. Consul in the country wherein the school of graduation is or was located.

13. Evidence must show school of graduation was acceptable at time of issuance of diploma.

14. Diplomates of National Board of Medical Examiners eligible on reciprocity basis.

15. (a) Internship completed in foreign countries after July 1, 1934 not acceptable. (b) Graduates of medical schools of Europe and Asia prior to Nov. 19, 1941 not accepted. (c) Graduates of medical schools of South American Republics, Mexico and Cuba not accepted.

16. Graduates of continental European medical schools after Jan. 1, 1940 not acceptable. Graduates of medical schools in Mexico and Latin and South America required to complete two years of approved internship or postgraduate medical study.

17. License to practice medicine and surgery in country in which school of graduation is located, otherwise required to complete senior year in approved medical school in United States.

18. Applicants limited to university medical schools of Great Britain.

19. Medical education completed in foreign medical schools since 1941 not acceptable.

20. (a) Matriculants in foreign medical faculties subsequent to Jan. 1, 1949 not acceptable. (b) Applicant must be licensed to practice medicine and surgery in country in which school of graduation is located.

21. European graduates after 1939 limited to English speaking schools.

22. Internship of one year in an approved hospital in the United States after acquiring full citizenship required. If application is accepted, the board has established basic recommendations which must be met prior to citizenship.

23. This requirement may be waived.

24. Recognition limited to graduates of schools accepted by Council on Medical Education and Hospitals of the American Medical Association and Executive Council of Association of American Medical Colleges.

25. Graduates of foreign medical schools after Jan. 1, 1940 not accepted.

26. Graduates of foreign medical schools are considered individually. Graduates of medical schools in Europe who obtained the medical degree after Jan. 1, 1940 are not eligible unless they have graduated from one of the schools listed by the Council on Medical Education and Hospitals of the American Medical Association and the Executive Council of the Association of American Medical Colleges, or have done some special work in an approved medical school in the United States or a recognized hospital.

27. Graduates of foreign medical schools not included on list issued by the Council on Medical Education and Hospitals of the American Medical Association and the Executive Council of the Association of American Medical Colleges may be accepted if they possess either a certificate of the National Board of Medical Examiners or the certificate of one of the American boards in the specialties.

28. List of foreign medical schools prepared by the Council on Medical Education and Hospitals of the American Medical Association and Executive Council of the Association of American Medical Colleges accepted.

29. Graduates of foreign medical schools who matriculated in medical school prior to Jan. 1, 1941 are eligible to apply for admission to the examinations. Graduates after Jan. 1, 1941 must be graduates of a medical school approved by the Approving Authority for Colleges and Medical Schools of the Commonwealth of Massachusetts, The Approving Authority has not approved any foreign medical schools.

30. Permissible by law at the discretion of the board.

31. Graduates of continental European medical schools after 1939 not accepted.

32. Ruling regarding acceptance of first papers expires July 1, 1951. Unless extended full citizenship will be required.

33. Graduates of medical schools of continental Europe subsequent to 1943 not accepted.

34. Temporary license valid until citizenship is completed may be given.

performance of the graduates of foreign schools in state licensing examinations over a period of ten years, a preliminary list of foreign schools was published in February 1950 by the Council on Medical Education and Hospitals and the Executive Council of the Association of American Medical Colleges. In the preamble to this list, these two agencies state that they are of the opinion that medical institutions and medical organizations in the United States would be justified in considering current and past graduates of the medical schools listed on the same basis as graduates of approved medical schools in the United States. It was considered desirable to issue a preliminary listing rather than to wait until information could be compiled for all medical schools of the world, a process that will require years to complete. Since the initial list of thirty-eight schools was prepared in February 1950, six schools were added in July 1950 and five in February 1951. Since the list is still a preliminary one and other institutions will undoubtedly be added in the future, the position of the Council and the Executive Council with respect to schools not on this list is that they neither approve nor disapprove these schools but must leave to the individual institutions and organizations in the United States the decision whether they will accept graduates of these schools on the same basis that they accept graduates of approved medical schools in the United States. The forty-nine medical faculties comprising the current list are included in table 29.

Twenty-three licensing boards have reported the acceptance of this list in the consideration of applicants for licensure. Eleven of these boards stipulate that recognition is limited to graduates of schools on the list, two boards specify that graduates of foreign medical faculties after January 1, 1940 are not eligible unless they have graduated from a school on the published list; one board will accept other graduates if they possess either a certificate of the National Board of Medical Examiners or one of the American boards in the specialties. The remaining nine boards have reported they accept the list but do not specify whether or not they also accept graduates of other schools. Foreign-trained physicians are not eligible for licensure in fifteen states.

The present requirements for candidates seeking medical licensure in the United States and its territories and outlying possessions on the basis of credentials obtained in countries other than the United States and Canada are given in table 31. Thirty-nine boards will admit foreign physicians to the licensing examination under varying conditions, Georgia, Utah and the Virgin Islands which heretofore did not license foreign physicians have modified their regulations and will now accept applications for licensure. Seven boards do not require citizenship, while nineteen boards require full citizenship. Thirteen boards require that the applicant file first citizenship papers only. North Dakota which requires full citizenship will waive this requirement for displaced physicians and Virginia reported it may waive the requirement of first papers. Most states indicate the foreign graduate must serve an internship or residency or obtain further medical training in the United States. Other regulations apply equally to graduates of American medical schools.

From a review of table 31 it would appear that the opportunities for the licensure of foreign-trained physicians is being given consideration by the authorities in various states. In addition, Iowa, Kansas, North Dakota and South Dakota are attempting to aid the displaced physician in establishing a practice in the United States.

OFFICERS OF STATE BOARDS OF MEDICAL EXAMINERS

Alabama	Dr. D. G. Gill, 537 Dexter Ave., Montgomery 4.
Arizona	Dr. J. H. Patterson, 316 W. McDowell Road, Phoenix.
Arkansas	Dr. Joe Verser, Harrisburg.
California	Dr. Frederick N. Seatena, 1020 N. Street, Sacramento 14.
Colorado	Dr. George H. Gillen, 831 Republic Bldg., Denver 2.
Connecticut	Dr. Creighton Barker, 160 St. Ronan St., New Haven.
Delaware	Dr. J. S. McDaniel, 229 S. State Street, Dover.
District of Columbia	Dr. Daniel L. Seekinger, 4130 E. Municipal Building, Washington.
Florida	Dr. Homer Pearson, 701 Dupont Bldg., Orlando.
Georgia	Mr. R. C. Coleman, 111 State Capitol, Atlanta 3.
Idaho	Mr. Armand L. Bird, 305 Sun Bldg., Boise.
Illinois	Mr. Charles F. Kervin, Capitol Bldg., Springfield.
Indiana	Dr. Paul R. Tindall, 1138 K of P Building, Indianapolis 4.
Iowa	Dr. M. A. Royal, 506 Fleming Bldg., Des Moines.
Kansas	Dr. O. W. Davidson, 772 New Brotherhood Bldg., Kansas City.
Kentucky	Dr. Bruce Underwood, 620 S. Third Street, Louisville 2.
Louisiana	Dr. R. B. Harrison, 1507 Hibernia Bank Building, New Orleans.
Maine	Dr. A. P. Leighton, 192 State Street, Portland.
Maryland	Dr. Lewis P. Gundry, 1215 Cathedral Street, Baltimore 1.
Massachusetts	Dr. Robert C. Cochrane, Room 37, State House, Boston 33.
Michigan	Dr. J. E. McIntyre, 100 W. Allegan Street, Lansing 8.
Minnesota	Dr. J. F. DuBois, 230 Lowry Medical Arts Building, St. Paul 2.
Mississippi	Dr. Felix J. Underwood, Jackson 113.
Missouri	Mr. John A. Hailey, State Capitol Building, Jefferson City.
Montana	Dr. Sidney A. Cooney, 7 W. 6th Ave., Helena.
Nebraska	Mr. Oscar F. Humble, Room 1009, State Capitol Building, Lincoln.
Nevada	Dr. G. H. Ross, 112 N. Curry Street, Carson City.
New Hampshire	Dr. John S. Wheeler, 107 State House, Concord.
New Jersey	Dr. E. S. Hallinger, 28 West State St., Trenton.
New Mexico	Dr. Charles J. McGoey, Coronado Bldg., Santa Fe.
New York	Dr. J. L. Lochner, 23 S. Pearl Street, Albany.
North Carolina	Dr. Joseph J. Combs, 419 Professional Bldg., Raleigh.
North Dakota	Dr. C. J. Glaspel, Grafton.
Ohio	Dr. H. M. Platter, 21 S. Broad Street, Columbus.
Oklahoma	Dr. F. C. Gallaher, 813 Braniff Building, Oklahoma City.
Oregon	Mr. Howard I. Bobbit, 609 Failing Building, Portland 4.
Pennsylvania	Mrs. M. G. Steiner, 351 Education Building, Harrisburg.
Rhode Island	Mr. Thomas B. Casey, 306 State Office Building, Providence.
South Carolina	Dr. N. B. Heyward, 1329 Blanding Street, Columbia.
South Dakota	Dr. Clarence E. Sherwood, 109 Center St., W., Madison.
Tennessee	Dr. H. W. Qualls, 1635 Exchange Building, Memphis 3.
Texas	Dr. M. H. Crabb, 1714 Medical Arts Building, Fort Worth.
Utah	Mr. Frank E. Lees, 314 State Capitol Building, Salt Lake City 1.
Vermont	Dr. F. J. Lawliss, Richford.
Virginia	Dr. K. D. Graves, 631 First St., S.W., Roanoke.
Washington	Mr. J. D. McDougall, Olympia.
West Virginia	Dr. N. H. Dyer, Capitol Bldg., Charleston 5.
Wisconsin	Dr. C. A. Dawson, Tremont Bldg., River Falls.
Wyoming	Dr. Franklin D. Yoder, Capitol Bldg., Cheyenne.
Alaska	Dr. W. M. Whitehead, Box 140, Juneau.
Canal Zone	Dr. S. D. Avery, Balboa Heights.
Guam	Dr. John Y. Battenfeld, Agana.
Hawaii	Dr. I. L. Tilden, 1020 Kapiolani St., Honolulu.
Puerto Rico	Mr. Luis Cueto Coll, Box 3717, Santurce.
Virgin Islands	Dr. Earle M. Rice, St. Thomas.

The Federation of State Medical Boards of the United States at its meeting in February 1951 adopted the following resolution:

RESOLVED, That all graduates of continental European medical schools who obtained their medical education after 1938 in schools not on the list maintained by the Council on Medical Education and Hospitals and the Association of American Medical Colleges as printed in the Journal of the American Medical Association in February 1950, and graduates of Latin American medical schools be required to complete two years of additional

approved medical education in the United States and the Dominion of Canada, before being admitted to a State Board licensing examination.

While an attempt has been made to present the situation as it exists, it should be borne in mind that this tabulation is intended to present a summary of existing requirements and that the licensure of all physicians is one of the "State's Rights" and physicians are urged to supplement the information contained in table 31 by direct communication with the licensing boards.

TABLE 32.—*Graduates of Foreign Medical Faculties Representing Additions to the Medical Profession, 1950*

	Examination	Reciprocity and Endorsement	Total
California	39	2	41
Connecticut	7	2	9
District of Columbia	2	0	2
Florida	3	0	3
Georgia	1	0	1
Illinois	38	0	38
Indiana	1	0	1
Iowa	1	0	1
Maryland	9	0	9
Massachusetts	1	0	1
Mississippi	1	0	1
Missouri	1	0	1
New Jersey	2	0	2
New York	133	29	162
North Dakota	4	0	4
Ohio	12	0	12
Rhode Island	1	0	1
South Dakota	2	0	2
Texas	1	0	1
Virginia	1	0	1
Washington	3	1	4
Guam	0	7	7
Puerto Rico	1	0	1
Virgin Islands	3	0	3
Totals	267	41	308

TABLE 33.—*Physicians Examined on the Basis of Credentials Obtained in Countries Other Than the United States and Canada, 1930-1950*

Year	Number Examined	Passed	Percentage Failed
1930	167	92	44.9
1931	158	91	42.4
1932	182	96	47.3
1933	200	129	35.5
1934	285	170	40.2
1935	437	303	30.7
1936	588	382	35.0
1937	920	637	30.8
1938	1,164	716	38.5
1939	1,691	839	50.4
1940	2,088	948	54.7
1941	1,717	698	59.2
1942	1,630	890	45.4
1943	1,031	518	49.8
1944	691	325	53.0
1945	475	209	56.0
1946	495	221	55.3
1947	601	283	52.9
1948	639	311	51.3
1949	737	319	56.7
1950	799	359	55.0
Totals	16,695	8,536	48.2

Figures relating to foreign-trained physicians examined for medical licensure in 1950 are presented in table 30. These statistics represent both American and foreign-born physicians educated in countries other than the United States and Canada. Graduates of 139 medical schools and five licensing corporations were examined. The number examined totaled 799 and were tested in thirty states, the District of Columbia, Hawaii, Puerto Rico and the Virgin Islands. The number who were successful was 359; failures numbered 440 or 55 per cent. Graduates of the University of Vienna represented the largest group from any one school, 54, who were examined in ten states, with a failure percentage of 57.4. Fewer than 36 of the graduates of any other school were tested.

The greatest number of foreign-trained physicians examined for licensure last year by any one state (New York) was 433, of whom 140 passed and 293 (67.7 per cent) failed.

Represented in table 32 are figures regarding foreign-trained physicians registered in 1950 who were not previously licensed in the United States and therefore are additions to the medical profession. There were 308 physicians in this group, 267 of whom were licensed by written examination and 41 by endorsement of credentials.

Table 33 records the number of foreign-trained physicians examined for medical licensure in the United States in twenty-one years (1930 to 1950). In this period 16,695 were examined, of whom 8,536 passed and 48.2 per cent failed. The lowest percentage of failures in 21 years was 30.7 per cent in 1935.

BOARDS OF EXAMINERS IN THE BASIC SCIENCES

A basic science law provides for the establishment of a board of examiners and requires that each person who desires to practice the healing arts appear before that board and demonstrate his knowledge of the basic sciences. Such boards are distinct from licensing boards. A certificate of proficiency in the basic sciences does not authorize the possessor to practice the healing art; it enables him only to apply for licensure.

A basic science certificate is a prerequisite for medical licensure in 18 states, the District of Columbia and the Territory of Alaska. The states comprising this group, together with the year of enactment of their basic science law, are recorded in table 34. Basic science legislation was adopted in Nevada in 1951.

The subjects in which examinations are given are specified in the law. Table 35 lists the states and the subjects in which examination is required. These subjects are not uniform although all boards examine in anatomy, pathology and physiology, 18 examine in chemistry, 16 in bacteriology, 11 in hygiene, and two in diagnosis and in public health.

The laws in some states provide for certification without examination by exemption, waiver, reciprocity or endorsement. The credentials acceptable for certification by one of these methods are outlined in table 36.

The results of examinations given and the number of certificates issued on the basis of waiver, exemption, reciprocity or endorsement as reported by the basic science boards are shown in tables 37 and 38. The laws do not specify that a candidate reveal his school of practice. The lists submitted by the respective boards, however, have been checked with the biographic records of physicians and medical students maintained by the American Medical Association and with various directories. In this way it has been possible to determine the profession of the majority of candidates. By this means the data presented have been tabulated in four groups; namely, physicians, medical students and dentists; osteopaths; chiropractors and naturopaths, and unclassified applicants. The latter category includes those for whom it was not possible to determine the profession represented. It is probable that the majority of those in this latter group include osteopaths, chiropractors and naturopaths.

The twenty boards in operation in 1950 examined 5,225 candidates. The numbers examined in the four groups are shown in table 37. Physicians, medical students and dentists represent the greatest number examined. There were 2,989 in this group. There were also examined 210 osteopaths, 466 chiropractors and 1,105 in the unclassified group. Of all applicants 34.3 per cent failed, of the physicians, medical students and dentists examined 12.1 per cent failed, osteopaths 27.1 per cent, chiropractors 76.4 per cent and unclassified 51.1 per cent. Among those who passed there were 2,627 physicians, medical students or dentists, 153 osteopaths, 110 chiropractors and 540 unclassified candidates. The basic science board of Iowa examined the greatest number, representing 173 physicians or medical students, 126 osteopaths, 187 chiropractors and 549 others with 50.4 per cent failures. Florida, Michigan and Minnesota examined more than 600. The percentage of failures in these states was 30.0, 20.4 and 60.8, respectively. The lowest percentage of failures was in Oklahoma, 4.5 per cent. In 1950 only physicians or medical students were examined in this state.

It is the policy of the Arizona and Minnesota boards in reporting results of its examinations to omit the names of applicants who fail examinations. The numbers who fail are threfore recorded only in the total column.

Physicians, medical students and dentists were tested by all boards, osteopaths by 13 boards, chiropractors by 12 boards, while figures for 12 boards are included in the unclassified group.

Fifteen boards issued 2,526 certificates by reciprocity, endorsement, waiver or exemption. The number of successful applicants (5,956) registered by examination and by endorsement are recorded in table 38. Included in the total certified were 4,803 physicians, medical students and dentists, 249 osteopaths, 192 chiropractors and 712 others.

TABLE 34.—*States Having Basic Science Laws and Year of Enactment*

Alaska	1946	Nebraska	1927
Arizona	1936	New Mexico	1941
Arkansas	1929	Oklahoma	1937
Colorado	1937	Oregon	1933
Connecticut	1925	Rhode Island	1940
District of Columbia	1929	South Dakota	1939
Florida	1939	Tennessee	1943
Iowa	1936	Texas	1949
Michigan	1937	Washington	1927
Minnesota	1927	Wisconsin	1925

TABLE 35.—*Subjects Included in Basic Science Examinations*

	Examinations Required in							
	Anatomy	Bacteriology	Chemistry	Diagnosis	Hygiene	Pathology	Physiology	Public Health
Alaska	+	+	+	..	+	+	+	..
Arizona	+	+	+	..	+	+	+	..
Arkansas	+	+	+	..	+	+	+	..
Colorado	+	+	+	..	..	+	+	..
Connecticut	+	..	..	+	+	+	+	..
Dist. Columbia	+	+	+	..	..	+	+	..
Florida	+	+	+	..	..	+	+	..
Iowa	+	+	+	..	+	+	+	..
Michigan	+	+	+	..	+	+	+	+
Minnesota	+	+	+	..	+	+	+	..
Nebraska	+	+	+	..	+	+	+	..
New Mexico	+	+	+	..	..	+	+	..
Oklahoma	+	+	+	..	..	+	+	..
Oregon	+	..	+	..	+	+	+	..
Rhode Island	+	+	+	..	..	+	+	..
South Dakota	+	+	+	..	..	+	+	..
Tennessee	+	+	+	..	..	+	+	..
Texas	+	+	+	..	+	+	+	+
Washington	+	..	+	..	+	+	+	..
Wisconsin	+	..	..	+	..	+	+	..

In twenty-four years, 37,487 physicians, medical students and dentists were examined, of whom 32,113 were successful in their examinations. In the same period 9,100 other practitioners were tested and 4,546 were successful. By both examination and endorsement (table 39) there were 42,383 certificates issued to physicians and 3,510 to other practitioners.

TABLE 36.—*Reciprocity, Endorsement, Waiver or Exemption Policies of Basic Science Boards*

	Credentials Accepted
Alaska	Certificate of National Board of Medical Examiners and license issued in states with which the Alaska Board of Medical Examiners reciprocates.
Arizona	(1) Certificate of basic science boards that examine in same subjects as does Arizona. (2) Examinations in same subjects as Arizona requires of other basic science boards accepted. Applicant required to take examination in other subjects. (3) Applicants from states having basic science boards accepted if license was issued prior to enactment of basic science law.
Arkansas	Certificate of basic science boards of all states except Florida, Iowa and New Mexico.
Colorado	(*a*) Certificates obtained by examination from the following basic science boards: Arizona, Arkansas, District of Columbia, Minnesota, Nebraska, New Mexico, Oklahoma, Oregon, Rhode Island, South Dakota, Tennessee and Texas. (*b*) Applicants who present basic science certificates from the Connecticut and Wisconsin boards are examined in chemistry and bacteriology. (*c*) Complete reciprocity with the Iowa Basic Science Board is granted to those whose original application was received on or before June 1, 1949. Others must pass four of the five subjects given by the Colorado Board.
Connecticut	No reciprocity. Board may in its discretion waive examination.
District of Columbia	Board may exempt an applicant and accept in lieu of examination proof that the applicant has passed before a basic science or licensing board an examination in subjects required by District of Columbia basic science board. Diplomates of the National Board of Medical Examiners may also be exempt from examination.
Florida	None.
Iowa	Certificate by exemption granted if credentials presented are equal to those of Iowa basic science board.
Michigan	Certificates from Arkansas, Minnesota and Nebraska basic science boards.
Minnesota	(*a*) Certificate of basic science boards of Arizona, Arkansas, Colorado, Michigan, Nebraska, Oklahoma, Oregon, South Dakota, Tennessee and Texas. (*b*) Applicants from Alabama, Georgia, Louisiana and the District of Columbia granted partial credit. (*c*) Medical Boards of Arizona, Indiana, Kentucky, Michigan, Missouri, New York, Oklahoma, Texas, Vermont and Virginia. (*d*) Part I of the examination of the National Board of Medical Examiners.
Nebraska	Certificate issued by waiver to applicants who have passed a written examination before another basic science board or licensing board in the six subjects required by Nebraska basic science board.
New Mexico	None.
Oklahoma	A certificate of Ability in the Basic Sciences is a prerequisite to examination for license (but not to license by reciprocity) by the Oklahoma Board of Medical Examiners. This certificate may be issued on the basis of exemption.
Oregon	Certificate in the basic sciences obtained by examination in Arkansas, Colorado, Iowa, Minnesota, Nebraska, New Mexico, South Dakota, Tennessee, Texas and Wisconsin.
Rhode Island	Endorsement with Massachusetts Board of Registration in Medicine.
South Dakota	Certificate of basic science boards, Arkansas, Colorado, Iowa, Minnesota, Nebraska, Oklahoma, Oregon, Tennessee, Texas and Wisconsin.
Tennessee	(*a*) Certificate of basic science boards of Arizona, Arkansas, Colorado, District of Columbia, Minnesota, Nebraska, New Mexico, Oklahoma, Oregon, South Dakota, Texas, Virginia and Wisconsin. (*b*) Granting of a certificate by waiver by accepting grades in required subjects earned by examination before a medical examining board or the National Board of Medical Examiners is handled on an individual basis.
Texas	Certificate of basic science boards of Arizona, Arkansas, Colorado, Iowa, Minnesota, Nebraska, Oklahoma, Oregon, South Dakota and Tennessee.
Washington	None.
Wisconsin	(*a*) Certificate of basic science boards of Arkansas, Iowa, Oregon, South Dakota and Tennessee. (*b*) Accepts certification on the basis of examination from any legally established board.

In 1950 there was a slight increase in the number of physicians examined while those certified without examination was 1,236 greater than in the previous year. The 2,176 physicians so registered in 1950 represents the largest number certified by basic science boards since their inception. Basic science boards are to be commended for the noticeable trend toward the recognition of basic science subjects of other boards, both medical and basic science.

Comparing the 1950 figures in the other practitioner group with 1949 it can be noted that the total registered was 503 fewer. The number examined decreased 313 and those certified by endorsement 190.

The fees for examinations in the basic sciences in the states requiring such certification are given in table 40.

Examinations are given in most instances twice a year although some of the boards hold examinations quarterly.

Basic science laws have been enacted in order that all who seek to care for sick and injured persons can be tested to determine whether they possess a reasonable knowledge of the sciences fundamental to the healing art. The results of the examinations demonstrate that, in general, practitioners other than physicians are not adequately equipped in the fundamentals of medical care. This is particularly significant since the testing for basic science registration is made by nonmedical examiners.

The present executive officer of each of the 20 basic science boards is as follows:

Arizona—Mr. Francis A. Roy, Science Hall, University of Arizona, Tucson.
Arkansas—Mr. L. E. Gebauer, 1002 Donaghey Building, Little Rock.
Colorado—Esther B. Starks, D.O., 1459 Ogden Street, Denver.
Connecticut—Mr. M. G. Reynolds, 110 Whitney Avenue, New Haven 10.
District of Columbia—Dr. Daniel L. Seckinger, 4130 East Municipal Building, Washington.
Florida—Mr. M. W. Emmel, University of Florida, Gainesville.
Iowa—Dr. Ben H. Peterson, Coe College, Cedar Rapids.
Michigan—Miss Eloise LeBeau, 101 North Walnut Street, Lansing.
Minnesota—Dr. Raymond N. Bieter, 105 Millard Hall, University of Minnesota, Minneapolis 14.
Nebraska—Mr. Oscar F. Humble, Room 1009, State Capitol Building, Lincoln 9.
New Mexico—Mrs. Marguerite Cantrell, P. O. Box 1522, Santa Fe.
Oklahoma—Dr. Frank C. Gallagher, 813 Braniff Building, Oklahoma City.
Oregon—Dr. C. D. Byrne, University of Oregon, Eugene.

TABLE 37.—*Applicants Examined in Basic Sciences, 1950*

	Physicians, Medical Students and Dentists		Osteopaths		Chiropractors and Naturopaths		Unclassified and Others		Total Examined	Passed	Failed	Percentage Failed
	P	F	P	F	P	F	P	F				
Alaska	1	1	0	0	0	0	0	0	2	1	1	50.0
Arizona	36	0	1	0	0	0	5	0	65	42	23*	35.4
Arkansas	87	5	0	0	7	7	0	0	106	94	12	11.3
Colorado	128	7	2	1	0	0	23	25	186	153	33	17.7
Connecticut	134	4	2	0	14	22	0	0	176	150	26	14.8
District of Columbia	10	2	0	0	0	0	0	0	12	10	2	16.7
Florida	317	86	5	2	12	11	153	110	696	487	209	30.0
Iowa	171	2	89	37	36	151	217	332	1,035	513	522	50.4
Michigan	475	102	1	1	0	1	34	27	641	510	131	20.4
Minnesota	178	0	36	0	14	0	50	0	710	278	432*	60.8
Nebraska	120	22	0	0	9	8	2	2	163	131	32	19.6
New Mexico	30	4	0	0	0	0	9	2	45	39	6	13.3
Oklahoma	64	3	0	0	0	0	0	0	67	64	3	4.5
Oregon	112	25	3	5	2	1	10	41	199	127	72	36.2
Rhode Island **	67	19	3	0	0	0	0	0	89	70	19	21.3
South Dakota	30	4	1	0	0	2	20	15	72	51	21	29.2
Tennessee	190	28	0	0	0	0	11	10	239	201	38	11.2
Texas	115	31	1	1	0	2	0	0	150	116	34	22.7
Washington	185	12	7	8	1	91	0	0	304	193	111	36.1
Wisconsin	177	5	2	2	15	60	6	1	268	200	68	25.3
Totals—Examined	2,989		210		466		1,105		5,225			
Totals—Passed	2,627		153		110		540			3,430		
Totals—Failed	362		57		356		565				1,795	
Percentage Failed	12.1		27.1		76.4		51.1					34.3

* Nature of practice undeterminable since names of failures not supplied.

TABLE 38.—*Basic Science Certificates Issued by Examination, Reciprocity and Endorsement, 1950*

	Examination					Reciprocity, Endorsement, Exemption or Waiver					
	Physicians, Medical Students and Dentists	Osteopaths	Chiropractors and Naturopaths	Unclassified and Others	Totals	Physicians, Medical Students and Dentists	Osteopaths	Chiropractors	Unclassified and Others	Totals	Registered
Alaska	1	0	0	0	1	14	0	4	0	18	19
Arizona	36	1	0	5	42	42	6	2	27	77	119
Arkansas	87	0	7	0	94	51	0	1	0	52	146
Colorado	128	2	0	23	153	41	12	3	12	68	221
Connecticut	134	2	14	0	150	0	0	0	0	0	150
District of Columbia	10	0	0	0	10	79	1	0	0	80	90
Florida	317	5	12	153	487	0	0	0	0	0	487
Iowa	171	89	36	217	513	84	0	0	30	114	627
Michigan	475	1	0	34	510	26	16	8	21	71	581
Minnesota	178	36	14	50	278	152	1	3	15	171	449
Nebraska	120	0	9	2	131	43	0	0	4	47	178
New Mexico	30	0	0	9	39	0	0	0	0	0	39
Oklahoma	64	0	0	0	64	1	0	0	0	1	65
Oregon	112	3	2	10	127	43	10	10	22	85	212
Rhode Island*	67	3	0	0	70	0	0	0	0	0	70
South Dakota	30	1	0	20	51	29	0	7	15	51	102
Tennessee	190	0	0	11	201	95	4	1	9	109	310
Texas	115	1	0	0	116	1,297	43	16	0	1,356	1,472
Washington	185	7	1	0	193	0	0	0	0	0	193
Wisconsin	177	2	15	6	200	179	3	27	17	226	426
Totals	2,627	153	110	540	3,430	2,176	96	82	172	2,526	5,956

TABLE 39.—*Total Candidates for Basic Science Certification, 1927-1950*

		Physicians, Medical Students and Dentists						Other Practitioners					
	No. of Boards	Examined	Passed	Failed	Percentage Failed	Endorsement	Total Certified	Examined	Passed	Failed	Percentage Failed	Endorsement	Total Certified
1927	5	305	279	26	8.5	26	305	22	15	7	31.8	1	16
1928	5	646	586	60	9.3	19	605	59	31	28	47.5	0	31
1929	7	668	610	58	8.7	75	685	66	31	35	53.0	0	31
1930	7	685	606	79	11.5	118	724	78	30	48	61.5	4	34
1931	7	680	586	94	13.8	141	727	107	48	59	55.1	0	48
1932	7	657	590	67	10.2	106	696	78	44	34	43.6	12	56
1933	8	601	527	74	12.3	121	648	60	30	30	50.0	10	40
1934	9	815	725	90	11.0	127	852	51	26	25	49.0	11	37
1935	10	882	761	121	13.7	110	871	74	33	41	55.4	4	37
1936	10	1,032	891	141	13.7	230	1,121	66	26	40	60.6	13	39
1937	12	1,231	1,061	170	13.8	192	1,253	113	41	72	63.7	10	51
1938	12	1,168	1,026	142	12.2	267	1,293	158	70	88	55.7	26	96
1939	14	1,141	1,013	128	11.2	727	1,740	218	97	121	55.5	294	391
1940	16	1,303	1,140	163	12.5	324	1,464	280	153	127	43.9	22	175
1941	17	1,768	1,560	208	11.8	280	1,840	356	191	165	46.3	73	264
1942	17	1,725	1,476	249	14.4	213	1,689	497	249	248	49.9	91	340
1943	18	2,330	2,098	232	10.0	206	2,304	389	211	178	45.8	86	297
1944	18	2,284	1,868	416	18.2	222	2,090	465	276	189	40.6	87	363
1945	18	2,576	2,146	430	16.6	412	2,558	397	193	204	51.4	172	365
1946	19	2,937	2,391	546	18.7	1,308	3,699	313	167	146	46.6	166	333
1947	19	3,132	2,405	727	23.2	771	3,176	406	228	178	43.8	189	417
1948	19	3,000	2,601	399	13.3	1,069	3,670	827	437	390	47.1	349	786
1949	20	2,932	2,540	392	13.4	940	3,480	2,239	1,116	1,123	50.2	540	1,656
1950	20	2,989	2,627	362	12.1	2,176	4,803	1,781	803	978	54.8	350	1,153
Totals		37,487	32,113	5,374	14.3	10,270	42,383	9,100	4,546	4,554	50.0	3,510	8,056

TABLE 40.—*Basic Science Fees*

Alaska	$25	Nebraska	$10[3]
Arizona	20	New Mexico	25
Arkansas	10[1]	Oklahoma	15[4]
Colorado	25	Oregon	10
Connecticut	10	Rhode Island	10
District of Columbia	25	South Dakota	15
Florida	10	Tennessee	10[5]
Iowa	10	Texas	15[2]
Michigan	10[2]	Washington	10
Minnesota	15[2]	Wisconsin	10[6]

1. Reciprocity, $30.
2. Reciprocity, $25.
3. Waiver, $15.
4. Reciprocity, $50.
5. Reciprocity, $ 5.
6. Reciprocity, $15.

Rhode Island—Mr. Thomas B. Casey, 366 State Office Building, Providence.
South Dakota—Dr. G. M. Evans, 310 East 15th Street, Yankton.
Tennessee—Dr. O. W. Hyman, 874 Union Avenue, Memphis.
Texas—Bro. Raphael Wilson, 306 Nalle Bldg., Austin.
Washington—Mr. Edward C. Dohm, Olympia.
Wisconsin—Mr. William H. Barber, 621 Ransom Street, Ripon.
Alaska—Dr. C. Earl Albrecht, Box 1931, Juneau.

NATIONAL BOARD OF MEDICAL EXAMINERS

The certificate of the National Board of Medical Examiners is accepted as an adequate qualification for registration by the medical licensing authorities of all the forty-eight states except Florida, Montana, Texas and Wisconsin. It is also recognized by the District of Columbia, the territories of Alaska, Hawaii and Puerto Rico and by the Canal Zone.

The licensing board of Louisiana exempts diplomates of the National Board from the state examination if such candidates have also been licensed in some other state with which Louisiana has established reciprocal relations. Additional examinations are required by some licensing boards. These are oral examinations in Hawaii, Illinois, Rhode Island and Wyoming and a brief supplemental written examination in Maine and in Michigan.

The boards of examiners in the basic sciences of Alaska, Arkansas, Connecticut, Iowa, Minnesota, Oklahoma, Tennessee and the District of Columbia honor the examination of the National Board and give a qualifying certificate to its diplomates without further examination. The Nebraska Basic Science Board accepts the National Board's examination in most instances after reviewing the answer papers.

Diplomates of the National Board are admitted to the final examination of the Examining Board in England, of the Triple Qualifications Board of Scotland and of the Conjoint Board in Ireland. The National Board admits directly to parts II and III of its examinations the diplomates of these boards provided they hold a degree in medicine from an acceptable university. Diplomates may also be admitted without further examination to the Mayo Foundation for Medical Education and Research provided they possess the other necessary qualifications.

The states, territories and possessions which will endorse the certificate are recorded in table 41.

In addition, many medical schools accept the National Board's examinations as part of their own examination and promotion procedures and other schools recommend that they be taken. Some schools require students to pass Part I at the end of the second academic year and Part II at the end of the fourth year. Other schools require only that Part II be passed by the end of the fourth academic year. There are a few schools at which those students who voluntarily take and pass the board's examinations either in Part I or II are excused from the corresponding final school examinations.

The requirements for admission to the National Board examination include a standard four year high school course, two years of acceptable college work including courses in English, physics, chemistry and biology and medical training satisfactorily completed in approved medical schools in the United States and Canada. Graduates of the university medical schools of Great Britain and Ireland have been admitted to the examination, provided these graduates have been licensed to practice in the country in which the school attended is located. The National Board may also consider individually applicants who present credentials from other universities, the records of which have been adequately verified, with further evidence of having completed acceptable professional service in the United States and who are citizens of the United States. The National Board accepts the list of foreign medical schools, dated Feb. 7, 1950 and later additions, prepared by the Council on Medical Education and Hospitals of the American Medical Association and the Association of American Medical Colleges.

In the following paragraphs data are presented for the thirty-second year regarding the examinations conducted and the issuance of certificates by the National Board.

The board was founded in 1915 and conducted its first examination in October 1916. From that date and up to and including a test given in June 1921, eleven examinations were given and 268 candidates were certified. The numbers examined during this period are recorded in annual figures in table 42.

The examination since 1922 has been given in three parts: Part I, consisting of a written examination in six basic science subjects; Part II, a written examination in five mayor clinical divisions and their component subjects or subdivisions. Parts I and II are given in approved medical schools throughout the country while Part III is given under direction of local subsidiary boards in 27 centers at times sufficiently frequent to accommodate all eligible candidates. Examinations in parts I and II are held simultaneously in February, June and September. An examination in Part II only is held in April.

The tables that are hereinafter presented refer to the results of examinations in parts I, II and III since 1922 including those who passed and failed examinations and those certified.

Candidates are required to take all six subjects of Part I at a regular examination period unless entitled to

TABLE 41.—*Licensing Boards Endorsing the Certificates of the National Board of Medical Examiners*

Alabama	Idaho	Mississippi	Oregon
Alaska [3]	Illinois [1]	Missouri	Pennsylvania
Arizona	Indiana	Nebraska [3]	Puerto Rico
Arkansas [3]	Iowa [3]	Nevada	Rhode Island [1]
California	Kansas	New Hampshire	South Carolina
Canal Zone	Kentucky	New Jersey	South Dakota
Colorado	Louisiana	New Mexico	Tennessee [3]
Connecticut [3]	Maine [2]	New York	Utah
Delaware [4]	Maryland	North Carolina	Vermont
Dist. of Columbia [3]	Massachusetts	North Dakota	Virginia
Georgia	Michigan [2]	Ohio	Washington
Hawaii [1]	Minnesota [3]	Oklahoma [3]	West Virginia
			Wyoming [1]

1. Oral examination required.
2. Brief supplemental written examination required.
3. Examination in basic sciences accepted by state basic science board.
4. Requires two years of medical practice.

Some states exact additional requirements, i. e., a basic science certificate, proof of citizenship and an internship of one year. These are general requirements of all candidates for licensure.

TABLE 42.—*National Board Examinations, 1916-1921*

Year	Total Examined	Passed	Failed	Percentage Failed
1916	10	5	5	50.0
1917	40	31	9	22.5
1918	59	51	8	13.8
1919	52	51	1	1.9
1920	108	82	26	24.0
1921	56	48	8	14.2
Totals	325*	268	57	17.5

* Represents eleven examinations.

take an incomplete examination. An incomplete examination is allowed candidates taking Part I at the end of their second year in medical schools whose third year curricula includes courses in one or two subjects of this part. The subjects postponed may be taken at any examination period after the candidate has completed them in medical school. They are recorded in the tabulations here presented under the heading "Incomplete Examinations" and are excluded in calculating the percentage of failures.

A candidate is eligible for Part II after passing Part I and on successful completion of the medical course.

To be eligible for Part III a candidate must have passed the first two parts of the examination, received his degree and have satisfactorily completed an internship of one year in a hospital approved for such training by the Council on Medical Education and Hospitals of the American Medical Association, or have served in a laboratory acceptable to the board.

The figures shown in tables 43 and 44 cover details of examinations given in parts I and II in 1950 and also since 1922. The data presented represent examinations conducted rather than individuals examined since it includes candidates who fail and are reexamined during the same year and those who pass parts I and II in the same year.

In 1950, 3,678 examinations were given in Part I; 2,358 passed and 334, 9.0 per cent failed. There were 986 incomplete examinations given. In Part II, 1,863 examinations were held; 1,837 passed and 26, or 1.3 per cent, failed. Incomplete examinations are only rarely given in Part II. There were none given in 1950.

There have been 52,989 examinations given in Part I since 1922 and 26,830 in Part II. During this period 31,710 passed Part I and 25,449 passed Part II. In twenty-nine years there have been 5,114 failures in Part I, 9.6 per cent, and 1,335 in Part II, 4.9 per cent. The increasing recognition of the National Board's examinations by medical schools is reflected in the figures presented in these two tables, particularly since 1943. The greatest number of examinations were given in Part I in 1944 when medical schools were operating on an accelerated program. However, the number examined in Part II in 1950 exceeded the number so examined in 1943 by a few candidates.

Tests in Part III in 1950 totaled 1,752, including 1,736 successful examinations and 16, or 0.9 per cent failures. Results of examinations in this part in 29 years including 1950 are presented in table 45. During this period 22,440 were tested, of whom 21,903 were granted certificates. The percentage of failures in this final examination in 29 years was 2.3. Since 1915, 22,171 certificates have been awarded.

The 1,736 physicians certified as diplomates in 1950 represented 70 medical schools in the United States, five

TABLE 43.—*National Board Examinations in Part I, 1922-1950*

Date	Total Examinations	Passed	Incomplete	Failed	Percentage Failed
February 1950	473	399	38	36	7.6
June 1950	2,186	1,310	677	209	9.4
September 1950	1,019	649	271	89	8.8
Totals	3,678	2,358	986	334	9.0
1922	388	263	58	67	20.3
1923	507	349	77	81	18.8
1924	591	415	69	107	20.5
1925	608	400	50	158	28.3
1926	625	436	104	85	16.3
1927	702	452	159	91	16.8
1928	843	533	231	79	12.9
1929	1,006	675	331	90	11.8
1930	1,200	801	345	114	12.5
1931	1,277	755	425	97	11.4
1932	1,307	847	371	89	9.5
1933	1,234	782	316	136	14.8
1934	1,241	809	347	85	9.5
1935	1,264	785	410	69	8.1
1936	1,344	858	363	123	12.5
1937	1,435	871	415	149	14.6
1938	1,654	986	508	160	14.0
1939	1,733	1,048	460	225	17.7
1940	1,653	1,060	375	209	16.4
1941	1,640	1,087	346	207	16.0
1942	1,867	1,204	471	192	13.8
1943	2,656	1,441	962	253	14.9
1944	4,229	2,326	1,465	438	15.9
1945	3,865	2,106	1,475	284	11.8
1946	3,148	1,695	1,189	264	13.5
1947	3,514	1,844	1,352	318	14.7
1948	3,807	2,178	1,262	367	14.4
1949	3,823	2,337	1,243	243	9.4
1950	3,678	2,358	986	334	9.0
Totals	52,989	31,710	16,165	5,114	9.6

TABLE 44.—*National Board Examinations in Part II, 1922-1950*

Date	Total Examinations	Passed	Incomplete	Failed	Percentage Failed
February 1950	244	243	0	1	0.4
April 1950	1,223	1,202	0	21	1.7
June 1950	304	301	0	3	0.9
September 1950	92	91	0	1	1.0
Totals	1,863	1,837	0	26	1.3
1922	109	90	0	19	17.4
1923	192	170	2	20	10.5
1924	267	227	0	40	15.0
1925	342	309	0	33	9.6
1926	381	334	1	46	12.1
1927	361	314	1	46	12.8
1928	410	371	1	38	9.3
1929	465	399	19	47	10.5
1930	620	543	7	70	11.4
1931	719	630	2	87	12.1
1932	732	674	0	58	7.9
1933	714	651	0	63	8.8
1934	633	583	0	50	7.9
1935	689	620	0	69	10.0
1936	768	716	2	50	6.5
1937	855	803	1	51	6.0
1938	861	815	0	46	5.3
1939	938	884	0	54	5.8
1940	1,028	963	9	56	5.5
1941	1,001	954	1	46	4.6
1942	1,072	1,031	0	41	3.8
1943	1,861	1,805	0	56	3.0
1944	1,405	1,350	0	55	3.9
1945	1,599	1,565	0	34	2.1
1946	1,825	1,782	0	43	2.4
1947	1,641	1,613	0	28	1.7
1948	1,742	1,725	0	17	0.9
1949	1,737	1,691	0	46	2.6
1950	1,863	1,837	0	26	1.3
Totals	26,830	25,449	46	1,335	4.9

TABLE 45.—*National Board Examinations in Part III, 1922-1950*

Year	Total Examinations	Passed	Failed	Percentage Failed
1922	22	22	0	0.0
1923	82	81	1	1.2
1924	126	120	6	4.8
1925	219	206	13	5.9
1926	255	243	12	4.7
1927	293	272	21	7.2
1928	322	306	16	5.0
1929	352	337	15	4.3
1930	420	401	19	4.5
1931	437	419	18	4.1
1932	550	522	28	5.1
1933	551	526	25	4.5
1934	567	548	19	3.4
1935	598	578	20	3.3
1936	576	547	29	5.0
1937	668	630	38	5.7
1938	706	682	24	3.4
1939	770	729	41	5.3
1940	792	771	21	2.7
1941	910	885	25	2.7
1942	1,054	1,041	13	1.2
1943	1,230	1,213	17	1.4
1944	1,168	1,146	22	1.8
1945	1,245	1,232	13	1.0
1946	1,634	1,613	21	1.2
1947	1,741	1,723	18	1.0
1948	1,715	1,700	15	0.9
1949	1,685	1,674	11	0.6
1950	1,752	1,736	16	0.9
Totals	22,440	21,903	537	2.3

in Canada, one school no longer in operation and 11 foreign faculties of medicine. The names of the schools in the United States and Canada represented and the number of examinees from each are included in table 46.

The present schedule of fees is as follows: Part I, $20; Part II, $15, and Part III, $40, a total of $75. The full fee need not be paid at the time the examination is completed, since the board has established a loan fund which is available to all candidates taking the third part of the examination.

The figures thus far presented represent examinations given. The number of persons tested during any one year is recorded for the twenty-nine year period in table 47. The classification "Passed" or "Failed" in cases in which more than one examination has been taken in a given year are based on the results of the last examination during the year in question. Thus, if in 1950 a candidate passed Part I but at a subsequent examination in 1950 he failed Part II, he is computed in this tabulation as a failure. These figures reveal that there were 6,596 who took at least one of the tests of the National Board in 1950, as compared with 525 in 1922. The trend has been steadily upward. In 1950 the number of candidates was 103 greater than in the preceding year. In all, 91,225 persons were examined in one or more of the examinations annually in the 29 years shown, of whom 72,924 passed, 12,508 took incomplete examinations and 5,793 or 6.3 per cent, failed.

Diplomates licensed to practice medicine on the basis of their credentials increased from 2 in 1917 to 2,395 in 1950 (table 48) and 19,925 have been so licensed since the National Board was formed. In the same period, however, 22,171 have received the certificate of the board.

The National Board has for the past year been making a study of some of the technics of the objective type of examination to determine if the objective type of question might be an improvement over the essay type of question which has been used chiefly in the board's written examinations. As an initial step the board is introducing a group of multiple choice questions as part of the examinations in the subject of medicine in the Part II tests in 1951 and in pharmacology and materia medica in the Part I examination. These examinations are a combination of the essay type of question and the short answer type of question, whereby two hours of the examination time will be allowed for answering three questions of the essay type, and an hour and a half for answering the objective part of the test.

The constitution of the National Board of Medical Examiners provides for a membership of 33 persons, representing the federal services, the Federation of State Medical Boards of the United States, the Association of American Medical Colleges and the Council on Medical Education and Hospitals of the American Medical Association and members elected at large. The president of the board is Howard T. Karsner, M.D., Cleveland; the medical secretary is G. S. Rodman, M.D.; the executive secretary and treasurer is Mr. E. S. Elwood, and the associate secretary, John P. Hubbard, M.D. The address of the board is 225 South 15th Street, Philadelphia 2.

TABLE 46.—*Diplomates from Individual Medical Schools, 1950*

Medical College of Alabama	1	State Univ. of N. Y., Brooklyn	87
University of Arkansas	1	N. Y. Medical College	86
College of Medical Evangelists	29	New York University	102
Stanford University	4	State Univ. of N. Y., Syracuse	41
University of California	3	University of Buffalo	52
Univer. of Southern California	10	University of Rochester	43
University of Colorado	6	Duke University	52
Yale University	52	Bowman-Gray School of Med	1
George Washington University	69	Ohio State University	4
Georgetown University	77	University of Cincinnati	2
Howard University	12	Western Reserve University	8
Emory University	5	University of Oklahoma	2
Medical College of Georgia	1	University of Oregon	4
Stritch School of Med. of Loyola University	9	Hahnemann Medical College	31
Northwestern University	33	Jefferson Medical College	22
Univ. Chicago School of Med.	8	Temple University	29
University of Illinois	23	University of Pennsylvania	35
Chicago Medical School	6	University of Pittsburgh	7
Indiana University	1	Woman's Medical College	1
State Univ. of Iowa	24	Medical College of S. C.	2
University of Kansas	1	Meharry Medical College	7
University of Louisville	9	University of Tennessee	2
Tulane University	17	Vanderbilt University	
Johns Hopkins University	12	Baylor University	1
University of Maryland	14	Southwestern Medical School	
Boston University	51	University of Texas	5
Harvard Medical School	122	University of Utah	4
Tufts College Medical School	84	University of Vermont	32
University of Michigan	26	Medical College of Virginia	9
Wayne University	2	University of Virginia	1
University of Minnesota	12	Marquette University	18
St. Louis University	9	University of Wisconsin	2
Washington University	11	McGill University	17
Creighton University	15	Queen's University	2
University of Nebraska	10	University of Toronto	12
Albany Medical College	37	University of Manitoba	1
Columbia University	115	University of Western Ontario	2
Cornell University	48	Extinct School	1
		Foreign Schools	15
Total			1,736

TABLE 47.—*Parts I, II and III, Excluding Duplications, 1922-1950*

Year	Total Examinations	Passed	Incomplete	Failed	Percentage Failed
1922	525	381	58	86	18.4
1923	775	594	79	102	14.7
1924	978	756	69	153	16.8
1925	1,167	915	50	202	18.1
1926	1,161	930	105	126	11.9
1927	1,248	947	142	159	14.4
1928	1,430	1,101	211	118	9.7
1929	1,723	1,280	319	124	8.8
1930	2,044	1,547	322	175	10.2
1931	2,218	1,632	410	176	9.7
1932	2,342	1,850	355	137	6.9
1933	2,277	1,806	280	191	9.6
1934	2,261	1,801	330	130	6.7
1935	2,368	1,831	408	129	6.6
1936	2,517	1,989	353	175	8.1
1937	2,735	2,151	397	187	8.0
1938	2,992	2,308	493	191	7.6
1939	3,221	2,476	443	302	10.9
1940	3,188	2,597	363	228	8.1
1941	3,318	2,749	332	237	7.9
1942	3,607	3,014	391	202	6.3
1943	4,514	3,671	606	237	6.1
1944	5,363	4,235	759	369	8.0
1945	5,614	4,468	886	260	5.5
1946	5,912	4,730	898	284	5.7
1947	6,249	4,905	1,002	282	5.3
1948	6,389	5,194	902	293	5.3
1949	6,493	5,376	880	237	4.2
1950	6,596	5,630	665	301	4.5
Totals	91,225	72,924	12,508	5,793	6.3

TABLE 48.—*Licenses Granted on the Basis of National Board Certificates, 1950*

Alabama	6	New Hampshire	22
Arizona	7	New Jersey	101
Arkansas	3	New Mexico	12
California	229	New York	642
Colorado	20	North Carolina	33
Connecticut	133	North Dakota	2
Delaware	1	Ohio	75
District of Columbia	63	Oklahoma	5
Georgia	11	Oregon	17
Idaho	13	Pennsylvania	135
Illinois	104	Rhode Island	14
Indiana	26	South Carolina	6
Iowa	33	South Dakota	3
Kansas	14	Tennessee	14
Kentucky	12	Texas	63
Maine	32	Utah	11
Maryland	57	Vermont	20
Massachusetts	186	Virginia	28
Michigan	53	Washington	28
Minnesota	80	West Virginia	7
Mississippi	7	Wyoming	4
Missouri	20	Alaska	5
Nebraska	7	Hawaii	10
Nevada	4	Puerto Rico	17
Total			2,395

THE JOURNAL
OF THE AMERICAN MEDICAL ASSOCIATION
535 N. DEARBORN ST. . . . . CHICAGO 10, ILL.
Edited by . . . . . AUSTIN SMITH, M.D.
Associate Editor . . . . . JOHNSON F. HAMMOND, M.D.
Editor for Medical Literature Abstracts . GEORGE HALPERIN, M.D.

Subscription price . . Fifteen dollars per annum in advance
Cable Address . . . . . "Medic, Chicago"

COMMISSION ON FINANCING HIGHER EDUCATION OPPOSES FEDERAL AID TO MEDICAL EDUCATION

A new and authoritative voice spoke out in opposition to federal aid for medical education when the Commission on Financing Higher Education issued its statement on May 15, 1951. The commission, an independent body sponsored by the Association of American Universities and financed by grants from the Rockefeller Foundation and the Carnegie Corporation, is composed of the presidents of Johns Hopkins, Stanford, California Institute of Technology, Brown, Union and Missouri universities, the provost of Harvard University, the former acting president of Columbia and four civic leaders, including the chairman of the Board of Trustees of the University of Chicago.

While emphasizing strongly that more income for medical schools is imperative now, the commission, in discussing Senate Bill 337 now before the Senate and a similar bill which passed the Senate in 1949 but did not reach the floor of the House of Representatives, states:

> Legislation of this kind would introduce a new pattern for federal government financial assistance to higher education. Such a change needs much more thought than it has yet had. Our views are definite; we do not wish to see an expansion of direct federal financial subsidization of higher education in this country. If medical education should be directly subsidized, other educational programs might also claim such support. We believe such a course would be dangerous to the intellectual heritage of freedom and diversity which characterizes American higher education.
>
> Until it has been clearly demonstrated that other sources of support cannot finance medical education, we believe no such great and potentially far reaching innovation in federal financing should be undertaken.

The American Medical Association has been severely criticized in many quarters because it has opposed federal subsidy of the general operating costs of the medical schools on the grounds, first, that no adequate assurance has been offered that such support would not sooner or later impair or destroy the freedom of the medical schools, and, second, that the possibilities of securing adequate funds from private and local sources have not been fully explored. It is most heartening, therefore, that after mature consideration a group of responsible leaders in American higher education should have independently arrived at similar conclusions on this issue of fundamental importance to American education and American society.

The commission does not minimize the urgent need of the medical schools for immediate financial assistance. Its report points out that the financing of medical education has become a critical problem for universities with medical schools and that it should be a major concern of the people of the United States. The commission rejects as an unsound solution the suggestion that medical schools be separated from universities. It warns, however, that additional money must be found for the medical schools or such a course may be necessary to protect the other educational programs conducted by universities.

The commission suggests that aid to the medical schools and relief for their parent universities should come from several sources. It urges, first, that medical educators re-examine their programs with a view to finding opportunities for economizing. It recommends that the community services provided by medical schools be removed in large part from educational budgets and that the costs of hospital and medical care be met by patient charges, by local government appropriations, and by hospital and medical care insurance programs.

The commission's third recommendation is that agencies supporting medical research should bear most, if not all, of the costs, direct and indirect, of such research. At present, grants for research projects by private foundations, corporations, and the federal government leave sizable proportions of the cost of these projects to be defrayed from instructional budgets.

The report urges that states increase their appropriations for medical education and points to the subsidy of privately operated medical schools by the state of Pennsylvania as an example of state aid.

The fifth and last recommendation of the commission is that income from gifts should be increased. The commission points out that, if every member of the medical profession contributed an average of $100 a year to the support of medical schools, nearly $18,000,000 in new income would be provided. A strong plea is made for corporations to support not only medical research but also medical education. The commission cites the newly launched National Fund for Medical Education as providing appropriate machinery for such contributions.

The commission concludes in its review of these possible sources of additional money for the medical schools with this challenge: Individuals and corporation officials who object to government subsidy of medical education surely have the responsibility of producing other income. No discussion of this conclusion is necessary. It is a direct challenge to the nation.

MEDICAL SOCIETIES RALLY TO SUPPORT THE FOUNDATION

The American Medical Education Foundation was established as an instrument through which individual physicians and medical societies could contribute effectively to a nationwide program to raise substantial funds for medical education. The way in which state and county medical societies as well as individual physicians are availing themselves of this opportunity is most encouraging. Less than a month after the Foundation was established, the California Medical Association led the way for society giving with a donation of $100,000. California's generosity was quickly followed by gifts from the state societies of Virginia and West Virginia. At its annual meeting last week, The South Carolina Medical Association came vigorously to the support of the Foundation with a handsome gift of $10,000. To the Greenbrier Valley Medical Society of West Virginia goes the distinction of being the first county society to contribute to the fund.

Many other state and county societies have reported that they are now organizing to raise funds for the Foundation. Two weeks ago, the House of Delegates of the Medical Society of the State of New York voted to set up machinery for securing contributions from its members and set a goal of $250,000 for 1951. Ohio has been active from the start in urging its members to contribute to the Foundation and at present is leading all states in the number of individual contributions. The Denver County Society is carrying out an intensive campaign of talks before hospital staffs, letter writing, telephone calls, and personal visits to its members to raise a substantial sum.

A number of other state and county societies have also reported that they have active programs under way and will be sending in their contributions shortly. An incomplete check of state and county medical journals reveals that well over 50 editorials and articles on the Foundation have been published. These various activities make it clear that across the nation the medical profession is mobilizing to show its intense interest in this venture and to insure the success of this new undertaking, which has already been hailed in many quarters as one of the most timely and constructive programs ever established by American medicine. The National Fund for Medical Education [1] has provided strong new forces from business, industry, labor, and agriculture who are pledged to assist in raising a large voluntary fund for medical education. Physicians, therefore, are not working alone to solve one of the nation's major health problems. Rather they are joined in a cooperative effort that President Conant of Harvard has described as "an example of the way a free people can face up to a problem."

Physicians who have not already given to the Foundation will find a convenient form on which they may make their contributions on pages 42 and 43 of the advertising section of this issue of THE JOURNAL.

MEDICAL LICENSURE

The 49th annual report on medical licensure prepared by the Council on Medical Education and Hospitals is published in this issue of THE JOURNAL. Data are presented concerning the medical examination and the licensure of physicians in the United States and its territories and outlying possessions for the year 1950. In addition, the report summarizes trends in licensure over many years. Current regulations pertaining to medical licensure are presented.

In 1950, 12,209 licenses to practice medicine and surgery were issued by the medical examining boards of the 48 states, the District of Columbia, Alaska, Guam, Hawaii, Puerto Rico, and the Virgin Islands. The 12,209 licenses issued last year represented 5,454 granted after written examination and 6,755 granted by reciprocity and endorsement of state licenses or the certificate of the National Board of Medical Examiners. Of the latter number, 2,395 of the recipients were diplomates of the National Board. The number of licenses issued annually continues to exceed the prewar years. In 1950, there was a slight increase over the preceding year.

Licentiates of 1950 who received their first license to practice medicine and surgery during the calender year and represent additions to the medical profession numbered 6,002. The number of physicians who died in 1950 was 3,794. Thus the physician population in the United States and its territories and outlying possessions was increased by 2,208.

Last year 722 failures were reported. Failures by graduates of approved medical schools in the United States amounted to 2.9%; by graduates of medical schools in Canada 8.5%, and by the graduates of approved medical schools no longer in operation 6.7%. The greatest percentage of failures were represented by graduates of three groups of schools—foreign faculties of medicine, unapproved medical schools and schools of osteopathy. In these groups, 55, 62.2 and 28%, respectively, failed.

The report also includes the preprofessional and professional educational requirements of each licensing board, the states requiring an internship for licensure, regulations pertaining to the registration of interns and residents, licensure on the basis of government credentials and the issuance of temporary permits.

A basic science certificate is a prerequisite for medical licensure in 18 states, the District of Columbia, and the Territory of Alaska. In the last calendar year, 5,956 certificates were issued. Of the 5,225 applicants tested by examination, 34.3% failed. Of the physicians, medical students and dentists examined, 12.1% failed. Of the osteopaths, chiropractors and unclassified candidates, 27.1, 76.4, and 51.1%, respectively, failed. Fifteen boards issued 2,526 certificates by reciprocity, endorsement, waiver, or exemption. The number so certified was 1,236 greater than in the previous year. Legislation creating a basic science board in Nevada was enacted in 1951.

1. Editorial: The National Fund for Medical Education and the American Medical Education Foundation, J. A. M. A. **146**: 258 (May 19) 1951.

The medical licensing boards of all states except Florida, Montana, Texas, and Wisconsin recognize the certificate of the National Board of Medical Examiners for registration without written examination. It is also recognized by the District of Columbia, the territories of Alaska, Hawaii, and Puerto Rico, and by the Canal Zone. In 1950, 1,752 physicians were certified as diplomates of the National Board, representing graduates of 70 medical schools in the United States, five in Canada, one extinct medical school and 11 foreign faculties of medicine.

LICENSURE OF FOREIGN-TRAINED PHYSICIANS

In February, 1950, the Council on Medical Education and Hospitals in collaboration with the Association of American Medical Colleges published its first listing of foreign medical schools whose graduates they recommended for consideration by medical institutions and medical organizations in the United States on the same basis as graduates of approved medical schools in the United States. This initial list included 38 schools. Six schools were added to the list in July, 1950, and five in February, 1951, bringing the total to 49.

Twenty-three licensing boards have reported that they have adopted this list. Eleven of these boards limit the licensure of foreign-trained physicians to graduates of schools on the list; two boards specify that graduates after Jan. 1, 1940, are not eligible unless they have graduated from one of these schools, while one board will accept graduates of other schools if they possess the certificate of the National Board of Medical Examiners or the certificate of one of the American boards in the specialties. The remaining nine boards reported they accept the list but do not specify whether they also accept graduates of other schools. There are only 15 states now in which foreign-trained physicians are not eligible for licensure. During the past year, Georgia, Utah, and the Virgin Islands modified their regulations and will accept applications for licensure from foreign-trained physicians.

Of the 39 boards that accept foreign-trained physicians, 19 require full citizenship, 13 require the filing of first citizenship papers, while seven have no citizenship requirement. Two boards have indicated that they may waive the requirement of citizenship.

The licensing boards of four states have announced that they are willing to make special efforts to aid displaced physicians in following their profession until they meet the requirements for licensure.

A comparison with regulations of previous years indicates that the licensing boards are giving increasing consideration to the licensure of foreign-trained physicians. Last year the number of foreign medical graduates examined for medical licensure totaled 799. Applicants were tested in 30 states, the District of Columbia, Hawaii, Puerto Rico, and the Virgin Islands. The number who were successful in their test was 359; failures numbered 440, or 55%. There were 134 graduates of foreign medical schools licensed without examination in 22 states and Guam. The total number of foreign-trained physicians licensed in 1950 numbered 493. Of this number, 308 were licensed for the first time and thus represent additions to the physician population in the United States —267 were licensed after written examination and 41 by endorsement of credentials.

ALDRIN AND DIELDRIN POISONING

Because of the success that has been demonstrated in insect control by the use of chlorinated hydrocarbon insecticides, it may be expected that during the coming spring and summer season the use of these materials will be intensified and increased. The use of large quantities of these insect poisons can be anticipated, particularly in the Southern and cotton-raising states. Aldrin and dieldrin are two of the newer substances that will probably be used in many areas. Since any new material may present a problem in diagnosis and treatment, it seems appropriate at this time to present what may be considered the present state of knowledge with regard to these two compounds.

Both these compounds are chlorinated hydrocarbons and may be expected to produce in the organism typical symptoms of chlorinated hydrocarbon intoxication. Thus, their action will center primarily on the central nervous system or in the gastrointestinal system when ingested.

Aldrin or dieldrin may be used either in the powdered state for dusting or in oil as emulsifiable concentrates. If exposure is to the powder, the material may be absorbed by inhalation, through the skin or by swallowing. Accidental poisoning from dust formulations is most likely to occur by ingestion. Concentrates or emulsions contain xylene, kerosene or some other solvent that facilitates absorption of aldrin and dieldrin. The solvents, themselves, are also capable of producing symptoms. Skin irritation and other local symptoms of solvent poisoning are of minor importance when compared with the danger of systemic toxicity, which can result from cutaneous absorption of aldrin and dieldrin. Multiple dermal exposures are the most hazardous, with toxicity equal to that of parathion for both compounds. The danger of accidental poisoning by inhalation is unknown. Intravenous toxicity, which is possibly the closest measure of potential danger from respiratory exposure, is three to six times that of dichlorodiphenyltrichloroethane (DDT) for aldrin or dieldrin. As has been shown by DDT, the intrinsic toxicity cannot always be used as an exact measure of inhalation dangers, since the physicochemical characteristics of the insecticide and its various formulations materially influence the degree to which the toxicant is absorbed in the respiratory passages. It is, therefore, imperative that the diagnosis of inhalation poisoning by aldrin or dieldrin be supported by a definite history of such exposure. Experimental evidence indicates that they have a greater chronic toxicity than any of the chlorinated hydrocarbon insecticides.

Since the physiologic action of aldrin and dieldrin can be expected to resemble that of similar chlorinated hydrocarbons, it is suggested that the following outline be used

in the observation of either actual or suspected cases of acute exposure to either of these substances. If the materials have been ingested, the first manifestation of such acute intoxication may be nausea and vomiting. It should be remembered, however, that acute poisoning may occur in the absence of pronounced gastrointestinal symptoms. The first evidence of intoxication may be peripheral nervous system involvement, and the patient should be watched closely for any evidence of hyperirritability. Although pulmonary edema has not been seen early in the cases so far reported, patients should be closely observed for such manifestations as labored breathing and rales. In addition to hyperirritabiilty, tonic and clonic convulsions can be expected to develop, which may or may not be separated by periods of depression. The available clinical data on these compounds indicate that significant depression between convulsive seizures may not be a consistent finding. Death can occur both during convulsions and during periods of depression and may be delayed two to 12 days or more.

Chronic intoxication will probably first be characterized by headache and general malaise. Sudden unexplained loss of weight may be significant. The loss of weight will almost surely be concomitant with loss of appetite. Although no authentic cases of chronic intoxication of humans have thus far been reported, animal experimentation has shown that both compounds possess a high order of chronic toxicity. A direct correlation between anorexia and weight loss has been observed. In chronic poisoning it has been suggested that there may be a latent period of several weeks between the last exposure and the development of symptoms; therefore, if chronic intoxication is suspected, it would be valuable to obtain a definite history of exposure over a rather long period of time.

If the skin has been contaminated with a chemical, the area should be washed thoroughly with soap and water. Although operators and formulators have been constantly warned to wash the skin immediately on contact with the material, varying degrees of carelessness can be expected in the use of these compounds. Contaminated clothing should be removed immediately and washed thoroughly.

If either of these materials has been ingested, the stomach should be washed out as quickly as possible; later, adequate quantities of magnesium sulfate should be given, in order that the ingested material may be purged rapidly. Close observation of the patient should be continued for at least 48 hours and preferably for 72 hours, in order that the first signs of any nervous system involvement may be noted. Tremors that gradually develop into episodes of convulsions separated by periods of depression may be suspected to be due to the insecticide. At the first suggestion of nervous system involvement, barbiturate therapy should be instituted with due consideration for their depressive properties. Pentobarbital sodium U.S.P., amobarbital sodium N.F., or other short-acting barbiturates may be employed. When immediate effects are desired, however, thiopental sodium U.S.P. may be employed if it is given slowly and in small amounts. Although barbiturates may often be given in excess of normal doses without serious danger to the patient, if convulsions have already occurred the patient should be watched carefully, lest he suffer more from the treatment than from the illness.

Dextrose U.S.P. may be administered intravenously, care being taken that not too much fluid is given parenterally, since pulmonary edema might result. In cases of either acute or chronic intoxication, high protein therapy may be advantageous, since liver damage may be produced by either type of poisoning, particularly by the latter. For this purpose the intravenous administration of amino acids is recommended. The use of morphine is definitely contraindicated. The administration of epinephrine or other sympathomimetic amines should be avoided.

Because even ingested material may result in the production of pulmonary edema, it is advisable that oxygen therapy be instituted as soon as practicable after the patient is first seen. It is desirable that oxygen be given even though pulmonary edema is not yet present. Early administration of oxygen will frequently eliminate the appearance of pulmonary edema or in any event will mitigate its seriousness if and when it does develop. The importance of oxygen administration cannot be overstressed, regardless of whether the material was absorbed by ingestion, through the skin or by inhalation.

In acute intoxications, kidney damage will probably be manifested by the presence of hemolyzed blood in the urine; therefore, the result of the benzidine test may be positive in the absence of red cells in the urine.

Although this clinical regimen is only preliminary, it appears to provide the best treatment available in the light of present information concerning these compounds.

THE PHYSICIAN'S STORY

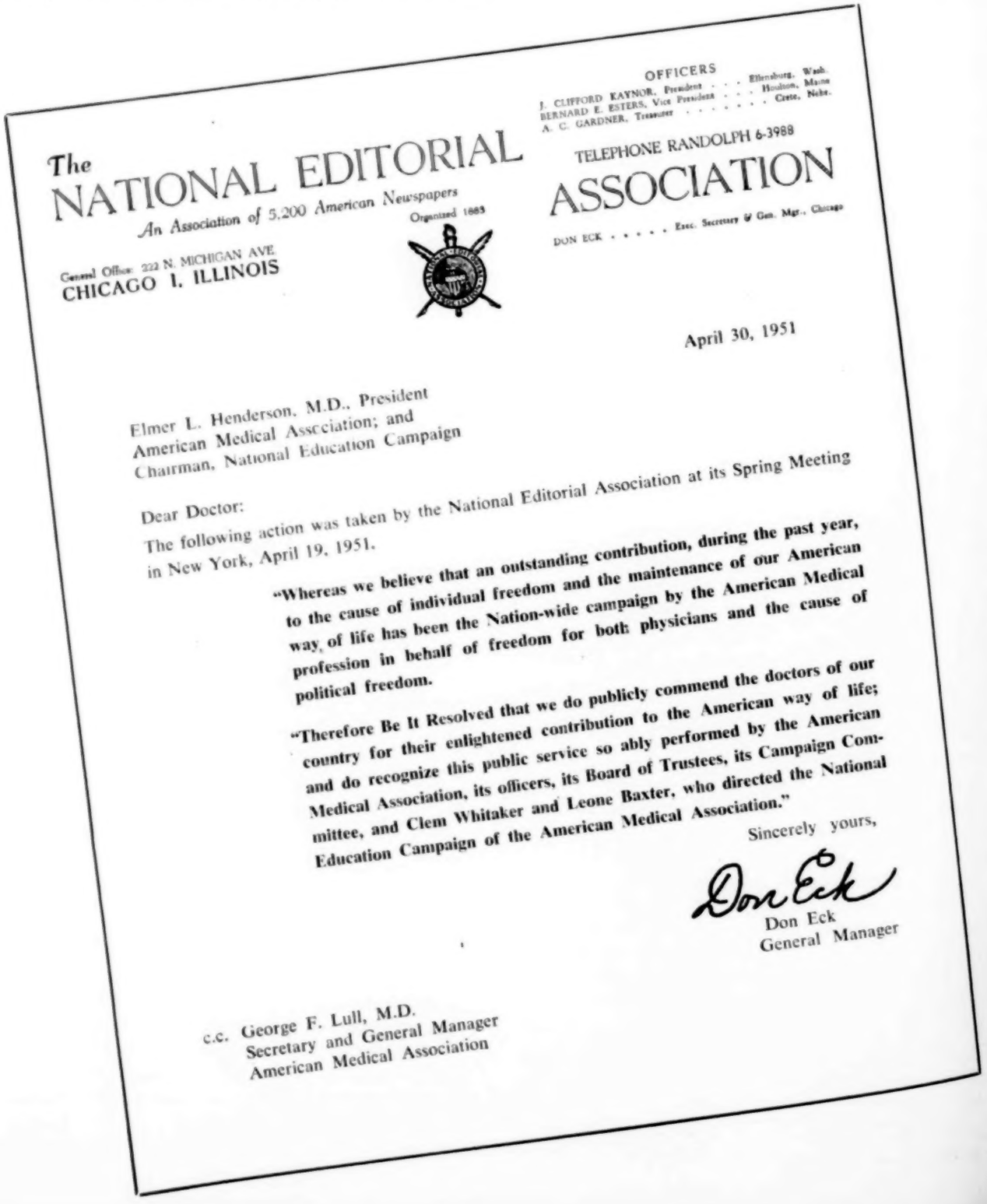
Health and the availability of medical service are always of interest to the people of this country. It is not surprising, then, to see the frequency with which mention of these subjects is made in the press. Sometimes the authors of such articles do not present truthfully, or without a misleading slant, the information that is available to those who honestly wish to seek and analyze without bias such data. Of the several articles that have appeared recently in national magazines, two will be of particular interest to physicians. Written by Paul deKruif and appearing in the May and June issues of *Reader's Digest,* they are entitled, respectively, "Your Doctor for a Friend" and "What About This 'Doctor Shortage?' " Without emotion, but in a friendly informative way, some truly revealing facts are made available. As a result, the public in general unquestionably will be better informed of some of medicine's problems and how the medical profession is attempting to solve them. DeKruif and *Reader's Digest* are to be commended for their reporting in these two stories.

A TRIBUTE TO DOCTORS FROM THE PRESS

In my inaugural address last June I paid a sincere tribute to the newspapers of the nation for their unswerving devotion to the cause of freedom. That devotion has been demonstrated again and again throughout the history of America; but never more dramatically than during the medical profession's crusade against government domination.

It is especially heartwarming, therefore, to learn that one of the great newspaper groups, The National Editorial Association, representing 5,200 non-metropolitan papers, has taken official action commending the doctors of America for their contribution to the American way of life. I have received, on behalf of all members of the American Medical Association, the following letter from Mr. Don Eck, General Manager of the NEA. I know I speak for all of you when I express my sincere appreciation of the fine tribute it contains.

ELMER L. HENDERSON, M.D.,
LOUISVILLE.



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April 30, 1951

Elmer L. Henderson, M.D., President
American Medical Association; and
Chairman, National Education Campaign

Dear Doctor:

The following action was taken by the National Editorial Association at its Spring Meeting in New York, April 19, 1951.

"Whereas we believe that an outstanding contribution, during the past year, to the cause of individual freedom and the maintenance of our American way of life has been the Nation-wide campaign by the American Medical profession in behalf of freedom for both physicians and the cause of political freedom.

"Therefore Be It Resolved that we do publicly commend the doctors of our country for their enlightened contribution to the American way of life; and do recognize this public service so ably performed by the American Medical Association, its officers, its Board of Trustees, its Campaign Committee, and Clem Whitaker and Leone Baxter, who directed the National Education Campaign of the American Medical Association."

Sincerely yours,

Don Eck

Don Eck
General Manager

c.c. George F. Lull, M.D.
Secretary and General Manager
American Medical Association

THE PRESIDENT'S PAGE

A FAREWELL MESSAGE

It hardly seems possible that this is the last message I shall send to you through THE JOURNAL as President of the American Medical Association. The months since I first took on this reportorial assignment for Editor Austin Smith, and the year since I took the oath of office in San Francisco, have been full, arduous, and infinitely rewarding. I only hope that I have been able to give in some small proportion to what I have received.

It is not my purpose here to report in any detail on the events and the accomplishments of the past year. They will be covered in full during the annual convention in Atlantic City next month. Rather, I would like to write in a more personal vein, about a few of the many, many things that have impressed me deeply during my tenure of office.

Serving as President of the greatest medical association in the world is in itself an honor that will always be cherished with humility and gratitude. But it is more. It is an opportunity—an opportunity to serve, an opportunity to observe. What service I may have rendered was given joyfully and with full awareness of the pressing needs of the day. It is the cumulative service of all physicians that has carried the American medical profession to its present high station and has given to this nation a new and vital leadership in affairs of citizenship.

I have been in a position peculiarly advantageous for the observation of such service—both within and outside of the profession—and what I have seen has been the most heartening experience of my life. It has renewed and implemented my faith in the ability of the individual to face his problems and meet them with wisdom and courage—to give of himself to his fellow man so that life may be richer and blessed with greater liberty and opportunity for all.

Last month I told about my experiences on a mission to the Far East. The loyalty and selfless devotion of our colleagues in uniform is magnificient. It is matched only by the bravery, the sacrifice and the patriotism of the men in combat. Just a few days ago I returned from another part of the world, where brave Americans are waging a different sort of battle against the aggressive enemy, communism: With Dr. R. L. Sensenich, one of my predecessors as President, I visited U. S. Air Force hospitals and dispensaries in France and Germany. The medical profession can be proud of its place in the military establishment, as the nation can be proud of its armed forces.

Preceding this tour, Dr. Sensenich, Dr. Louis H. Bauer, Chairman of the Board of Trustees, and I attended a meeting of the council of the World Medical Association in Geneva, and on the way home I stopped in Paris to speak before a meeting of the French chapter of the International College of Surgeons. These two meetings left me with a deep sense of admiration for the men and women of our profession who are devoting so much time and effort to world-wide improvement of medical standards and who are proving day by day that men of good will can work together across geographic, political and racial barriers.

One of the highlights of the Geneva conference was a joint session of the World Medical Association and the World Health Organization; the latter, as you know, is a United Nations subsidiary. The World Medical Association represents physicians, the WHO represents countries, but in the field of public health their purposes run parallel and they cooperate closely.

The work of these two great organizations, and the work of other groups, such as the International College of Surgeons, has assumed importance far beyond the field of medicine. By serving as forums for the exchange of ideas between men and women of vastly different backgrounds and environments, they initiate a realization of brotherhood that seems beyond the best efforts of diplomacy. Medicine's high role in world affairs is firmly rooted in the very nature of its own work. Illness knows no politics, no creed, no racial barriers. Neither do the healing arts.

Medicine's leadership in the service of humanity is world-wide, but it begins at home. In the United States, men of medicine have proved that the defense of their profession and of all professional freedom, all individual liberty is a cause they can and will espouse with vigor and determination. As I look back over the years of our crusade against government domination, I am supremely proud of my profession, of my fellow physicians. Once we stood almost alone. But not for long. We have presented the case for the American system of medicine honestly and factually, and the people have rallied to our side. We have gained good friends, strong friends—friends who will stand by us, and by whom we will stand firm, too.

This new entente is symbolized, I think, by three addresses, copies of which you have received by now. My successor as President of the American Medical Association, Dr. John W. Cline, gave one of the of the finest expositions of medicine's case against socialization that I have ever heard or read when he spoke before the New York City Town Hall last February. In a warm, human, forceful statement, Mr. William L. Hutcheson, general president of the United Brotherhood of Carpenters and Joiners of America, and first vice president of the American Federation of Labor, left no possible doubt that a large segment of our great labor force knows that "socialized medicine is no bargain!"

In another New York talk, Dr. Louis H. Bauer, appearing before the National Editorial Association, emphasized clearly and factually the close cooperation of two great professions, medicine and the press of the nation, in championing freedom. I have asked Dr. Austin Smith, the Editor, to reproduce on an adjoining page of this issue a splendid commendation, awarded on this occasion to doctors for their contribution to the American way of life, in their campaign to maintain an unfettered profession. To thousands of doctors who have worked so earnestly both for professional freedom and for high medical standards, this commendation is heartening evidence of the great esteem in which the medical profession is held by more than 90 per cent of American newspapers.

Many others have spoken out impressively, too. I have just finished reading "What About This (Doctor Shortage)?" in the June *Reader's Digest*. For the second time in two months Paul de Kruif has written an article clearly showing what the medical profession is doing to meet the problems of the day. Both "What About This (Doctor Shortage)?" and "Your Doctor for a Friend"—in the May issue—are outstanding examples of fair, accurate reporting. De Kruif and the editors of *Readers' Digest* are to be complimented.

There will be many others, doctors and laymen, who will speak out impressively in the days and months to come. For this is a continuing task we physicians have assumed—a responsibility and an opportunity. In Dr. Cline, the American Medical Association will have a splendid, an inspiring leader. It will indeed be a privilege for all of us, whatever our role, to follow that leadership in keeping American medicine a strong and vital force in our nation's life.

ELMER L. HENDERSON, M.D.,
Louisville.

ORGANIZATION SECTION

REFERENCE COMMITTEES OF THE HOUSE OF DELEGATES

The Speaker of the House of Delegates of the American Medical Association has appointed delegates to serve on the reference committees of the House at the Atlantic City Session as follows:

SECTIONS AND SECTION WORK:

Willard A. Wright, *Chairman*, North Dakota
Percival Bailey, Section on Nervous and Mental Diseases
Harvey B. Matthews, Section on Obstetrics and Gynecology
Norman S. Moore, New York
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Dexter H. Witte, Wisconsin
John M. Porter, Kansas
William A. Hyland, Michigan
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Val H. Fuchs, Louisiana
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Harlan A. English, Illinois

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Denver M. Vickers, New York
Raymond M. McKeown, Oregon

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W. Palmer Dearing, United States Public Health Service
Herbert H. Bauckus, New York
Stanley H. Osborn, Section on Preventive and Industrial Medicine and Public Health
Hugh P. Smith, South Carolina

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Jesse D. Hamer, Arizona
Everett P. Coleman, Illinois
George Braunlich, Iowa
J. B. Lukins, Kentucky

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Charles T. Stone Sr., Section on Internal Medicine
Robert B. Homan Jr., Texas

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Ralph A. Johnson, Michigan
Bertie O. Edwards, North Carolina
Carlton E. Wertz, New York
James Z. Appel, Pennsylvania

EXECUTIVE SESSION:

Homer G. Hamer, *Chairman*, Indiana
Howard K. Petry, Pennsylvania
Donald Cass, California
Willis I. Lewis, Illinois
Charles J. Kickham, Massachusetts

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Maurice J. Dattelbaum, New York
John W. Green, California
William H. Halley, Colorado
Benjamin H. Minchew, Georgia

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Alfred S. Hartwell, Hawaii
Hoyt B. Woolley, Idaho
Clifford C. Sherburne, Ohio

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Eugene F. Hoffman, California
Robert H. Hayes, Illinois
Deering G. Smith, New Hampshire
Carl H. Gellenthien, New Mexico

SERGEANTS AT ARMS:

Hollis E. Johnson, *Chief*, Section on Diseases of the Chest
John K. Glen, Texas
Charles M. Hamilton, Tennessee

FEDERAL MEDICAL LEGISLATION

United States Medical Academy

Representative Heller of New York introduced H. R. 3931, which would create a medical training school for the armed services and the Public Health Service to be known as the United States Medical Academy. The President would select the location of the school on recommendation of the secretary of defense and the surgeon general of the Public Health Service.

Students would be nominated for admission as follows: Four students for each senator, representative, delegate in Congress and resident commissioner from Puerto Rico; six for the District of Columbia, and two by the governor of the Canal Zone. Candidates for admission are to be in the age bracket 20 to 25, graduates of a college or university, or possessing the qualifications for entrance to a medical school of the state of which they are residents. The course of study would be such as prescribed for the study of medicine by the American Medical Association. On graduation, students would be commissioned and required to serve for five years in a branch of the armed services or in the PHS or any other federal service.

The superintendent of the academy (he need not be a physician) would be appointed by the President and confirmed by the Senate for a term of 10 years. The secretary of defense and the surgeon general of the PHS, on the recommendations of the superintendent, would jointly fix the number of instructors, hours of instruction, and titles by which the several departments of instruction and offices of professor established in the academy would be known and would fix the compensation of all employees under the provisions of the Classification Act.

A board of visitors would be appointed each year, to be made up as follows: chairmen of the Committees on Armed Services of the Senate and House; Chairman of the Committee on Labor and Public Welfare of the Senate; Chairman of the Committee on Interstate and Foreign Commerce of the House; two other members of the Senate to be appointed by the Vice President, at least one of whom is a member of the Appropriations Committee; two other members of the House to be appointed by the Speaker, one of whom is a member of the Appropriations Committee, and five persons to be appointed by the President, three of whom, at least, shall be outstanding in the fields of medicine or medical research. The board would inquire into the curriculum, instruction, physical equipment, fiscal affairs, academic methods, and other matters relating to the academy. Within 60 days after an annual meeting, the board (which is purely advisory) would submit a written report containing recommendations to the President. The secretary of defense and surgeon general of the PHS would prescribe jointly such rules and regulations for the management and administration of the academy as they find necessary. This bill is identical with H. R. 9157 of the last Congress, also introduced by Representative Heller.

VA Presumption of Service-Connected Disability

Representative Jones of Alabama introduced H. R. 3996, which would amend the Veterans Regulations to provide that malignant tumors developing a 10% or more degree of disability within five years after separation from active service shall be presumed to be service-connected.

STATE LEGISLATION

Alabama

Bills Introduced.—H. 25 and S. 79 propose the creation of a **state board of ophthalmic dispensers** to have exclusive jurisdiction over the profession of dispensing opticians. S. 100, to amend the medical practice act, proposes certain conditions under which the board of medical examiners may establish **reciprocal relations** with examining boards in other states. S. 101, proposes the inauguration of a **scholarship** program to promote the education of nurses. S. 102, proposes the inauguration of a **scholarship** program to promote the education of Negro nurses.

The summary of federal legislation was prepared by the Washington Office of the American Medical Association and the summary of state legislation by the Bureau of Legal Medicine and Legislation.

MEDICAL NEWS

ARIZONA

State Medical Election.—The Arizona Medical Association at its meeting April 29 through May 2 installed Dr. Harry T. Southworth, Prescott, as president. Other officers elected included Dr. Edward M. Hayden, Tucson, vice president; Dr. Thomas H. Bate, Phoenix, president-elect; Dr. Frank J. Milloy, Phoenix, secretary; Dr. Clarence E. Yount Jr., Prescott, treasurer, and Dr. Harry E. Thompson, Tucson, speaker of the house of delegates. Dr. Jesse D. Hamer, Phoenix, was chosen as a delegate to the American Medical Association for a two-year term, with Drs. Preston T. Brown, Phoenix, and Harold W. Kohl, Tucson, as successive year alternates.

ARKANSAS

Doctor's Day.—The Arkansas legislature has established March 30 of each year as Doctor's Day in the state. This is believed to be the first action by a state legislature to make Doctor's Day official. The law requests the governor to issue annually a proclamation calling on the citizens of Arkansas to remember physicians that day. The woman's auxiliary to the Arkansas Medical Society was interested in effecting the legislation.

CALIFORNIA

San Francisco Society Honors Dr. Cline.—More than 500 physicians, civic leaders, and public officials honored Dr. John W. Cline, President-Elect of the American Medical Association, at a testimonial banquet in San Francisco given by the San Francisco Medical Society April 8. Dr. Cline is a past president of the society and a long-time member. From the national medical figures who could not attend came scores of letters and telegrams expressing regret and extending congratulations to Dr. Cline. Individual society members, hospitals, and organizations joined in extending congratulatory letters. The mayor of the City and County of San Francisco, the chief administrative officer, the chamber of commerce, representatives of public health and Stanford University, state medical and dental societies, the press, and others were represented. Dr. Cline addressed the group on "California Physicians' Service."

CONNECTICUT

State Medical Election.—Dr. F. Brae Rafferty, Willimantic, assumed office as president of the Connecticut State Medical Society at the society's annual meeting May 1 to 3 in Stratford. Dr. Edward J. Whalen, Hartford, was named president-elect; Dr. Oliver L. Stringfield, Stamford, first vice president, and Dr. Robert R. Agnew, Norwich, second vice president. Dr. Creighton Barker, New Haven, was re-elected executive secretary; Dr. Cole B. Gibson, Meriden, treasurer; Dr. Stanley B. Weld, Hartford, editor, *Connecticut State Medical Journal*, and Dr. Herbert Thoms, New Haven, literary editor. The meeting was the largest ever sponsored by the society and was attended by more than 1,000 physicians and guests.

Hospital Affiliates With Medical Center.—Affiliation of the newly-completed Greenwich Hospital in Greenwich, Conn., with the New York University-Bellevue Medical Center in New York City has been announced. Formally dedicated May 5, the hospital was constructed at a cost of $4,750,000, including the remodeling of buildings formerly in use. The hospital will have the advantages of a working relationship with a university medical center under the regional hospital plan of the Division of Affiliated and Regional Hospitals. This plan is a part of the teaching program of the medical center. The six-story building has 211 beds. Laboratories, facilities for surgery and service installations are large enough so that, as the community grows, the hospital's capacity may be increased to as many as 400 beds merely by extending the wings for patients.

Physicians are invited to send to this department items of news of general interest, for example, those relating to society activities, new hospitals, education and public health. Programs should be received at least three weeks before the date of meeting.

ILLINOIS

First State-Owned Tuberculosis Hospital.—Illinois' first state-owned tuberculosis sanitarium, located at Mt. Vernon, was dedicated and open to public inspection May 13. The sanitarium has facilities for 100 patients who may be admitted from any part of the state. It will be operated by the state department of public health, but the cost will be met by a local agency with the responsibility for the care and treatment of tuberculous patients, as provided by law. Other elements of the tuberculosis eradication program of the state include the operation of free chest x-ray units and aid to local tuberculosis sanitariums throughout Illinois. Illinois has had a steady decline in tuberculosis incidence since 1900, with deaths from this disease falling from more than 7,000 to about 2,000 in the half century. Dr. Roland R. Cross, state health director, was master of ceremonies at the dedication program, which included remarks by Gov. Adlai E. Stevenson; Dr. Harold M. Graning, regional director of the U. S. Public Health Service, Chicago; Dr. Kenneth G. Bulley, Aurora, president of the Illinois Tuberculosis Association; Dr. Andy Hall of Mt. Vernon, former state director of public health; Mrs. Laura Lunde, co-chairman, State-wide Tuberculosis Eradication Committee, and Dr. Edward A. Piszcek, chairman of the board of public health advisors to the Illinois Department of Public Health.

Chicago

Society News.—At the annual meeting of the Chicago Urological Society April 26 the following officers were elected: Dr. Frederick Lloyd, president; Dr. Jacob S. Grove, vice president, and Dr. Joseph H. Kiefer, secretary-treasurer.

Dr. O'Brien Succeeds Dr. Volini.—Dr. George F. O'Brien was appointed May 7 chairman of the department of medicine of the Stritch School of Medicine, Loyola University. Dr. O'Brien, who was formerly associate clinical professor of the same department, succeeds the late Dr. Italo Volini. Dr. O'Brien received his M.D. degree from Rush Medical College, Chicago, in 1927. He served in World Wars I and II, attaining the rank of colonel in the medical corps during the latter conflict. He was chief of medicine for General Hospital 297 (Cook County Hospital Unit), which saw two years' service in Europe.

MASSACHUSETTS

Muscle Research.—Dr. Albert Szent Gyorgyi, biochemist and Nobel prize winner in 1937, has received a grant-in-aid for a research program in the chemistry of muscle from Armour and Company. He and seven assistants at the Marine Biological Laboratories in Woods Hole, Mass., will try to establish the fundamentals of muscle chemistry, physiology and function and thus help in the control of some diseases involving muscle failure.

Shattuck Award.—At the April 26 meeting of the Massachusetts Public Health Association Dr. Henry Dexter Chadwick, Waltham, received the Lemuel Shattuck Award established by the association in 1949. Dr. Chadwick was cited for his "ten year program for the early detection of tuberculosis in children," which came to be known as the Chadwick Clinics. Dr. Chadwick is a former Massachusetts commissioner of public health and former president of the Massachusetts Tuberculosis League, the National Tuberculosis Association, and the Massachusetts Public Health Association.

MICHIGAN

Clinic Day at Bon Secours Hospital.—Members of the staff of Bon Secours Hospital, Grosse Point, will present an all-day program beginning at 10 a. m. June 5 in the assembly hall of the new building. A total of 17 papers will be given. Dr. Ellerton G. Aldrich will serve as moderator at the morning session, Dr. Galen B. Ohmart at the afternoon session, and Dr. Lyle E. Heavner at the evening session.

Dr. Redl Named to Franklin Memorial Chair.—Fritz Redl, Ph.D., professor in the school of social work at Wayne University, Detroit, has been named the Leo M. Franklin Memorial Professor in Human Relations at Wayne for the university year beginning in September. The memorial professorship carries an annual stipend of $1,000 over and above the professor's salary. Under the plan Wayne annually presents a lecture series known as the Leo M. Franklin Memorial Lectures in Human Relations. Dr. Redl is the author of books and of encyclopedia articles pertaining to his field.

MONTANA

Medical-Surgical Conference.—The Cascade County Medical Society is sponsoring the second annual Great Falls Medical-Surgical Conference June 25-26 at the Meadow Lark Country Club in Great Falls. Speakers include Drs. Stanley O. Hoerr, Cleveland Clinic; John L. Parks, professor of obstetrics and gynecology, George Washington University School of Medicine, Washington, D. C.; Ralph V. Platou, head of the department of pediatrics, Tulane University of Louisiana School of Medicine, New Orleans; Stewart G. Wolf Jr., associate professor of clinical medicine, Cornell University Medical College, New York, and Dawson A. Dowell, associate professor of radiology, Creighton University School of Medicine, Omaha.

NEW JERSEY

Personal.—Dr. May Sherman, Greystone Park, joined the medical staff of Winthrop-Stearns Inc., New York, effective March 26, as associate medical director. Dr. Sherman was pathologist at the New Jersey State and Manhattan State hospitals before joining the firm.

Study of the Chronically Ill.—A grant of $60,000 has been made by the Commonwealth Fund to the Hunterdon County Medical Center for a study of incidence of disabling chronic illness in the rural population. The study will be based on plans developed by the Commission on Chronic Illness, and field work will be carried out with consultation from the commission. The U. S. Public Health Service has made a preliminary grant of $10,000 to assist in planning a similar survey in an urban population. Prevalence of illness by disease will be measured, and the study will seek information on different types of care needed: hospital, home care, rehabilitation and other community services.

NEW YORK

Hospital Psychiatric Unit.—At its 85th anniversary April 6 St. Barnabas Hospital for Chronic Diseases completed plans for a $40,000 psychiatric unit expected to be ready by fall. It will care for chronic patients who after admission develop psychiatric conditions. The unit will include nine single rooms with flexible features that will permit its enlargement by ten more beds. Specialized facilities of the psychiatric hospital will be provided. The unit will be under the supervision of attending neuropsychiatrists from Columbia-Presbyterian Medical Center headed by Dr. Earl C. Chester and Dr. John M. McKinney, with Dr. Glen T. Smith, clinical director at St. Barnabas, in charge of medical treatment.

Community Nutrition Institute.—The fifth Community Nutrition Institute sponsored by Syracuse University and the New York State Department of Health will be held at the university June 18-23. Out-of-state speakers during the first week's program on special problems include:

Lionel B. Pett, Ottawa, Ont., Canada, Nutrition Programs in Canada.
James A. Reyniers, Notre Dame, Ind., Germ-free Life Studies.
Edward C. Reifenstein Jr., Oklahoma City, Calcium Metabolism.
James B. Allison, Ph.D., New Brunswick, N. J., Nitrogen Balance.

In the second week discussion will be given to the nutritional problems that are intensified in times of emergency. Out-of-state speakers will be:

Grace A. Goldsmith, New Orleans, Discussion of Recommended Emergency Allowances.
Jean Mayer, Boston, The World's Food Needs.

The approximate cost for the two-week institute including board, room, and all fees (except a $10 matriculation fee for those desiring graduate credit) is $120. Application for admission should be made to Anne Bourquin, College of Home Economics, Syracuse University, Syracuse 10.

New York City

Personal.—Dr. Samuel J. Prigal, assistant professor of medicine, New York Medical College, Flower-Fifth Avenue Hospital, will participate in the symposium on aerosol therapy June 1 and 2 in Turin, Italy, under the auspices of Minerva and Italian medical societies.

Heart Disease Research Grant.—Roosevelt Hospital has received a grant of $6,000 for research in the field of cardiovascular disease. The donor asked that the gift be anonymous. Dr. Arthur J. Antenucci, a member of the medical board of the hospital, is head of the project, which deals specifically with circulatory dynamics in cases of acute coronary artery thrombosis.

Union Opens Health Center.—The New York joint board of the Amalgamated Clothing Workers, C.I.O., on April 15 dedicated its 1 million dollar, six-story health center at 16 E. Sixteenth St., which will provide medical services for 40,000 members in the metropolitan district. Funds to maintain and operate it will be paid directly by the workers themselves by $10 additional dues during the first year. The center will also carry on a program for research in the fields of cardiovascular diseases and arthritis, for which the joint board has appropriated $250,000. Funds for the establishment of the center came from the New York Clothing Manufacturers Exchange and from the union. A staff of 75 doctors, 25 technicians, nurses, pharmacists, social workers, and others will take care of an estimated 750 patients per week, all by appointment. Services available include health examinations, laboratory screening tests, a pharmacy where drugs will be sold at cost, physical therapy, minor surgery and urology, x-ray and photofluoroscopy analysis, and deep therapy. Dr. Morris A. Brand, associate medical director of the Health Insurance Plan of Greater New York, is medical director. The research program will be conducted by Dr. Ernst P. Boas. Members of the medical advisory board are: Dr. Boas, chairman, Dr. Martin Steinberg, Dr. John J. Wittmer, Dr. Leonard J. Goldwater, and Dr. Mario F. Tagliagambe.

NORTH CAROLINA

Medical School to Celebrate Tenth Anniversary.—During commencement exercises scheduled for June 10-11 the tenth anniversary of the establishment of the Bowman Gray School will be observed. Special tribute will be paid at that time to members of the Gray family who made the school possible through their gifts. Harold W. Tribble, LL.D., president of Wake Forest College, will deliver the commencement address and Mark Depp, the baccalaureate sermon.

Personals.—Dr. Frank Ray Lock, professor of obstetrics and gynecology, has succeeded Dr. Coy C. Carpenter as medical director of North Carolina Baptist Hospital, Winston-Salem. Dr. Carpenter asked to be relieved of duties in the capacity in which he has served for the past ten years to devote more of his efforts to his duties as dean of the medical school and professor of pathology.——Dr. Parker R. Beamer, professor of microbiology and immunology at Bowman Gray School of Medicine of Wake Forest College, Winston-Salem, received the Moore County Award during the annual meeting of the Medical Society of the State of North Carolina in Pinehurst. The award goes to the author of the paper judged to be best of those presented in the meeting of the preceding year. Dr. Beamer's subject was, "Studies on Experimental Leptospirosis (Weil's Disease)."——Dr. C. Hampton Mauzy, associate professor of obstetrics and gynecology at Bowman-Gray School of Medicine, was chosen president-elect of the North Carolina Obstetrics and Gynecology Society at a recent meeting at Mid-Pines.

OHIO

Ohio Medical History.—A program devoted to the medical history of Ohio was given at the annual meeting of the committee on medical history and archives of the Ohio State Archaeological and Historical Society at the Ohio State Museum in Columbus April 28. Titles of papers presented are "Indian Materia Medica and Therapy in the Northwest Territory," "Medical Men of the Ohio Indian Wars, 1790-1796," "Medicinal Springs and Spas of Ohio," "Pathology in the Medical College of Columbus," "Development of the Teaching of Physiology in Ohio," and "An Unusual Physician's Notice."

PENNSYLVANIA

Personal.—Dr. Wallace L. Davidson, who has been in private practice in Pottstown, has been appointed industrial physician for the Glenolden and West Point, Pa., plants of Sharp & Dohme, Incorporated.

Tuberculosis and Health Association Home.—The Erie County Health and Tuberculosis Association has established headquarters in the Burton Homestead, a 100 year old landmark in Erie. The white frame building was known a century ago as the Mineral Springs Resort, where Erie poineers went to "take the water." The homestead also provides space for several health agencies; the Erie unit of the American Cancer Society has already established quarters there.

Philadelphia

University Alumni Meeting.—The 40th reunion of the 1911 medical class of the University of Pennsylvania will be held June 15 at the Radnor Hunt Club, 15 miles from Philadelphia.

Strittmatter Award to Dr. Brown.—Dr. Charles L. Brown, dean of the Hahnemann Medical College, was the recipient of the Strittmatter Award for 1951 from the Philadelphia County Medical Society at its meeting April 11. This award, consisting of a gold medal and a plaque, is presented each year to the "physician who has made the most valuable contribution to the healing arts or who has contributed extra-ordinary meritorious service to the medical profession." The subject of Dr. Brown's address of acceptance was "The Impact of Medical Education and Research on the Practice of Medicine."

SOUTH DAKOTA

State Medical Meeting.—The South Dakota Medical Association will hold its annual meeting in Aberdeen June 4-6 under the presidency of Dr. Louis J. Pankow, Sioux Falls. Speakers include:

Philip Thorek, Chicago, Acute Abdomen and Intestinal Obstruction.
Edith L. Potter, Chicago, Congenital Abnormalities of the Urinary Tract in Children.
Fremont Chandler, New York, Some Interesting Highlights in Orthopaedic Practice.
Robert E. Priest, Minneapolis, Tracheotomy and Bulbar Poliomyelitis.
Carlo S. Scuderi, Chicago, Backache, Its Diagnosis and Treatment from the Standpoint of the General Practitioner.
C. Allen Good, Rochester, Minn., Bronchogenic Carcinomas Stimulating Benign Lesions.
William J. Baker, Chicago, Carcinoma of the Prostate Gland, and Renal Tumor.
John H. Randall, Iowa City, Conduct of Abnormal Labor, and Malignancy of the Female Genital Tract.
Archibald L. Hoyne, Chicago, Eruptive Diseases of a Contagious Nature.
Raymond D. Pruitt, Rochester, Minn., Medical Care of Cardiac Patients Undergoing Surgery.
Maurice H. Stauffer, Rochester, Minn., Liver Biopsy.
Reynold A. Jensen, Minneapolis, Anxiety in Pediatrics.
Carl W. Laymon, Minneapolis, Malignancy of the Skin.
Mr. Mac. F. Cahal, Kansas City, Mo., The Academy of General Practice.
William H. Masters, St. Louis, The Rationale and Technique of Endocrine Replacement in the Aged Female, and a Preliminary Report.

VIRGINIA

Tuberculosis Foundation.—The Tuberculosis Foundation of Virginia received $200,000 from the estate of Mrs. Jennie W. Brothers of Fayetteville. It will be known as the Pattie Mae Fund and will be used to care for indigent tuberculosis patients. The trust fund was set up 28 years ago.

University Alumni Speakers.—Alumni speakers at the annual meeting of the University of Virginia Medical Alumni Association, Charlottesville, June 8 will be Dr. John S. Lawrence, professor of internal medicine, University of California School of Medicine, Los Angeles, and Rear Adm. H. Lamont Pugh, surgeon general of the U. S. Navy. Dr. Lawrence will address the meeting's morning session on "Physiology of White Blood Cells," and Admiral Pugh will speak at the annual dinner.

Outbreak of Vincent's Angina.—Dr. Albert S. McCown, Virginia Department of Health, has reported a high incidence of Vincent's angina in Tazewell County. More than 100 persons of all ages have been seen in a local hospital. The main complaint was an acute sore throat, often accompanied by a slight rise in temperature. A few instances of multiple family cases were observed, but close personal contact with other cases was usually absent. A similar outbreak occurred one year ago.

WEST VIRGINIA

New Mental Hygiene Service.—In March the mental hygiene clinic jointly sponsored by the state department of health and West Virginia State College, Institute, began an extension mental health service in McDowell County. The clinic team for this service includes Dr. Simon O. Johnson, psychiatrist and superintendent of Lakin State Hospital; Herman G. Canady, Ph.D., clinical pathologist, and Mrs. Ida B. Chamberlain, psychiatric social worker. The clinic was assisted by the services of guidance teachers and a public health nurse who screened the patients and supplied information for the clinic team. The McDowell County Health Department, through Dr. James A. Bennett, Algoma, director, offered its office facilities. Many more referrals were received than could be accepted for the first demonstration session. The responses and inquiries from parents, teachers and other community leaders revealed an enthusiasm that indicates a growing interest in permanent clinical services. While in McDowell County the clinic team assisted local citizens in establishing the McDowell County Mental Hygiene Society.

GENERAL

Physical Therapy Meeting.—The annual conference of the American Physical Therapy Association will be held at the Hotel Colorado, Glenwood Springs, Colo., June 17 to 22. Lectures and clinical workshops will be devoted to the following subjects: lower extremity amputees, chest disabilities, physical therapy in neuropsychiatric conditions, electrical stimulation, and testing.

Annual Meeting on Tuberculosis.—The American Academy of Tuberculosis Physicians will hold its annual session at the Seaside Hotel in Atlantic City, N. J., June 9 under the presidency of Dr. Jacob W. Cutler, Philadelphia. Subjects under discussion include: open pneumonolysis, the intermittent streptomycin treatment of tuberculosis, hematological and immunological observations in experimental histoplasmosis, benemid as an adjunct to para-amino-salicylic acid therapy, and BCG and the armed forces.

Institute for Tuberculosis Workers.—The National Tuberculosis Association will hold an institute for professional workers in state and local tuberculosis associations June 4 to 15 at Haven Hill Lodge, Milford, Mich. Association workers having from 10 months' to three years' experience are eligible, and applications may be obtained through state association offices. Topics for discussion will include the history of tuberculosis control, fact-finding, case-finding, health education, public relations, Christmas seal sale, problems of patients and their families, and veterans' services. The sessions will also cover the organization of a tuberculosis association, program and budget development, accounting for funds, personnel practices, and state and local relationships.

Friends Medical Society Formed.—The Friends Medical Society, established to give voice and expression to the medical implications of traditional Quaker principles, was formed Nov. 12, 1950. The group is a non-profit organization, open to physicians and medical students of both sexes. Although it has been initiated by a group of Quaker physicians affiliation with this society is open to non-Quakers as well. Membership does not imply any payment of dues, as the group will rely upon voluntary contributions for its support. Members of the advisory committee are: Dr. Joseph Stokes Jr., Children's Hospital, Philadelphia; Dr. Charles Perera, Columbia Presbyterian Medical Center, New York, and Dr. J. Huston Westover, May Imogene Bassett Memorial Hospital, Cooperstown, N. Y. Dr. Martin G. Vorhaus is chairman of the organization committee, 1130 Park Ave., New York 28.

Communicable Diseases Outside the United States.—According to a U. S. Public Health Service release May 10, 18 cases of smallpox were reported on May 1 in Tilburg, Netherlands. Another case due to close contact with a patient in Tilburg has

been reported in Utrecht. Between Jan. 27 and Mar. 21, 53 cases of jungle yellow fever with 19 deaths were reported in San Domingo de los Colorados, Ecuador. On Mar. 21 a fatal case was reported in the province of Esmeraldas. A total of 12,251 persons have been vaccinated since January in the two areas. An outbreak of typhoid fever in a town 35 miles south of Matamoros, Mexico, which is situated across the river from Brownsville, Texas, has been reported, but most recent information indicates that only two cases have been confirmed. It is also reported that 460 persons were vaccinated in an effort to control the outbreak. Typhoid fever, which was previously reported in Malaga, Spain, still exists despite sanitary measures taken by local authorities. The disease is also prevalent in Madrid, and in the Province of Valencia it is reported to be confined mainly to the rice-growing areas. Cholera and smallpox continue to be prevalent in India.

Gordon Research Conferences.—These conferences, sponsored by the American Association for the Advancement of Science, formerly known as the Gibson Island Research Conferences, will be held from June 18-August 31 at Colby Junior College, New London, N. H. Meetings are to be held in the morning and in the evening, Monday through Friday, with the exception of Friday evening. The purpose of the program is to bring experts up to date as to the latest developments, analyze the significance of these developments and to provoke suggestions as to underlying theories and profitable methods of approach for making new progress. It is an established rule that all information presented is not to be used without specific authorization of the individual making the contribution, whether in formal presentation or in discussion. No publications are prepared as emanating from the conferences. Accomodations are available for a limited number of women to attend each conference, also for wives who wish to accompany their husbands. Rooms are available at several inns and hotels in the area if reservations are made in advance. Requests for information should be addressed to W. George Parks, Director, Department of Chemistry, University of Rhode Island, Kingston. From June 15 to September 1, mail should be addressed to Colby Junior College, New London, N. H.

American Rheumatism Association.—This association will hold its annual meeting June 8-9 at the Hotel Dennis, Atlantic City, N. J., under the presidency of Dr. Otto Stein Brocker, New York. Invited speakers include:

Konrad Dobriner, New York, Adrenal Function and Steroid Hormone Metabolism in Health and in Disease.
Burton L. Baker, Ph.D., Ann Arbor, Mich., Observations on Local Action of Adreno-Cortical Steroids.

On Saturday Dr. Philip S. Hench, Rochester, Minn., will serve as moderator of a panel discussion on difficulties and complications in the therapeutic use of ACTH and adrenocortical steroids in the rheumatic diseases. Members of the panel will be Drs. Edward W. Boland, Los Angeles; W. Paul Holbrook, Tucson, Ariz.; Charles A. Ragan Jr., New York, and William D. Robinson, Ann Arbor, Mich. Other subjects to be presented include: significant remissions in rheumatic diseases with high dosage cortisone therapy, the problems of prolonged cortisone treatment for rheumatoid arthritis—further experiences, the clinical effects of cortisone administered orally to 100 patients with rheumatoid arthritis, and the use of postpartum plasma in rheumatoid arthritis and in patients resistant to cortisone and ACTH.

Society Elections.—The American Academy of Dermatology and Syphilology elected the following officers at its Chicago meeting: president, Dr. Donald M. Pillsbury, Philadelphia; vice president, Dr. James Lewis Pipkin, San Antonio, Texas, and secretary-treasurer, Dr. John E. Rauschkolb, Cleveland, who is reelected.——The National Academy of Sciences at its annual meeting in Washington April 23 to 25 elected a new home secretary, two members of the council of the academy, 29 members and three foreign associates. F. Alexander Wetmore, Ph.D., secretary of the Smithsonian Institution, Washington, D. C., was elected home secretary for a four year term beginning July 1 and ending June 30, 1955, succeeding Fred E. Wright, Ph.D., who has served in that capacity for the past 20 years. Dr. Wright was associated with the Carnegie Institution of Washington for many years. Other officers of the academy are: president, Detlev W. Bronk, Sc.D., Baltimore; vice president, Edwin B. Wilson, Ph.D., Brookline, Mass.; foreign secretary, Roger Adams, Sc.D., Urbana, Ill., and treasurer, William J. Robbins, Ph.D., New York.——The American Psychosomatic Society at its annual business meeting April 28 installed Dr. Roy R. Grinker, Chicago, president, and elected Dr. Sydney G. Margolin, New York, president-elect, and Dr. Frederick C. Redlich, New Haven, Conn., secretary-treasurer.

New England Society Meeting.—The spring meeting of the New England Obstetrical and Gynecological Society was held May 16 at the Hillcrest in Leicester, Mass. The program was as follows:

Ralph I. Dorfman, Ph.D., Shrewsbury, Mass., Metabolism of Progesterone.
Ronald C. Sniffen, Worcester, Mass., Testicular Biopsy in the Study of Sterility.
Henry L. Kirkendall, Worcester, Mass., Use of a New Androgen in Gynecology.
Jesse C. Hales, Gardner, Mass., Disastrous Sequelae to the Webster-Baldy Operation.
Eugene L. Richmond, Worcester, Mass., Sarcoma Botryoides of the Cervix.
Daniel L. Joyce, Woburn, Mass., Changes in the Practice of Obstetrics in the Last 25 Years.
Newlin F. Paxson, Philadelphia, Extra Peritoneal Caesarean Section (Moving Picture).
Edward J. Fairbanks, Worcester, Mass., Cornual Pregnancy Following Homo-lateral Salpingectomy.
Richard E. Hunter, Worcester, Mass., Antinatal Use of Dicumerol.
Harold J. Sparling Jr., Fitchburg, Mass., Pathology of Ovarian Tumors as Encountered in Community Hospital Practice.
Newlin F. Paxson, Philadelphia, Comparison of the Sling Operations for Urinary Stress Incontinence. Discussion by Langdon Parsons and Roy J. Heffernan.

Workshops for Crippled Children Personnel.—Members of the National Society for Crippled Children and Adults headquarters staff and a number of consultants will take part in 12 workshops at universities and colleges throughout the country this summer. John J. Lee, Ph.D., Detroit, former president and counselor in special education, will direct the work. Special education workshops will be held at the following institutions: University of Utah, Salt Lake City; University of Wyoming, Laramie; Eastern Montana College of Education, Billings; New Haven State Teachers College, New Haven, Conn.; Teachers College, Columbia University, New York; Michigan State Normal College, Ypsilanti, and School of Education, Syracuse (N. Y.) University. Staff members will lecture at training courses to be held at Wayne University, Detroit; Western Michigan College of Education, Kalamazoo, and Bowling Green State University, Bowling Green, Ohio. Further information may be obtained from the state society for crippled children of the state in which the course will be held or from program services of the national society at 11 S. LaSalle St., Chicago.

Chest Physicians Meeting.—The annual meeting of the American College of Chest Physicians will be held at the Ambassador Hotel, Atlantic City, N. J., June 7-10 under the presidency of Dr. Louis Mark, Columbus, Ohio. In addition to numerous papers, several symposiums are to be given. These and the participants are as follows:

ACTH and Cortisone in Diseases of the Chest, Edwin R. Levine, Chicago, moderator; James M. Carlisle, Rahway, N. J.; Smith Freeman, Chicago; Laurance W. Kinsell, San Francisco; John R. Mote, Chicago, and Maurice S. Segal, Boston.

Chemotherapy and Antibiotics in Diseases of the Chest, Karl H. Pfuetze, Chicago, moderator; Alvin Barach, New York; Sumner Cohen, Oak Terrace, Minn.; Gladys L. Hobby, Ph.D., Brooklyn; Alvis E. Greer, Houston, Texas; Eugene T. McEnery, Chicago; Leopoldo Molinari, Lima, Peru; Carl W. Tempel, Denver, and Selman A. Waksman, Ph.D., New Brunswick, N. J.

Occupational Diseases of the Chest, Edward C. Holmblad, Chicago, moderator; Louis L. Friedman, Birmingham, Ala.; Lloyd E. Hamlin, Chicago; George R. Meneely, Nashville, Tenn.; Frank Princi, Cincinnati; Oscar A. Sander, Milwaukee; Frank R. Ferlaino, Donald O. Hamblin, Edgar Mayer, and Leo Price, all of New York; Burgess L. Gordon, Philadelphia; Leo G. Rigler, Minneapolis; Reginald H. Smart, Los Angeles; Arthur J. Vorwald, Saranac Lake, N. Y., and C. Richard Walmer, Pittsburgh.

Round table luncheon meetings will be held. On Friday at 8 p. m. a motion picture session on diseases of the chest will be presented. Convocation and the president's banquet will take place Saturday evening.

CORRECTION

Progressive Spinal Cord Disease.—The following table, presenting the material on which their report was based, was inadvertently omitted from the paper by Strully, Gross, Schwartzman and von Storch which appeared in THE JOURNAL May 5, 1951, page 10.

Surgical Lesions Simulating Degenerative Diseases of the Spinal Cord

Patient	Age, Yr.	Race	Sex	Diagnosis	Yr. of Onset of Symptoms	Cerebrospinal Fluid Protein* Mg./100 Cc.	Roentgenogram of Cervical Vertebral	Myelography	Operation, Date and Findings†	Result
E. S.	45	White	♀	Multiple sclerosis	1933	.....	Localized mild osteoarthritis; slight narrowing intervertebral space C5-C6	Large "hourglass" filling defect C5-C6 with anterior filling defect in lateral view	Feb. 1950; calcified herniated disk C5-C6 with cord compression	Moderate but definite improvement
A. M.	36	Negro	♂	Syringomyelia, myelitis(?)	1948	95-80 & 83	Marked cervicodorsal scoliosis	Small filling defect left side C7-D1	Oct. 1949; calcified herniated disk C6-C7 chiefly on left side with cord compression	Considerable improvement
M. S.	40	White	♀	Multiple sclerosis(?), syringomyelia(?)	1941	57	Mild osteoarthritis C4, C5, C6; mild narrowing intervertebral space C5-C6	Deflection of pantopaque column from left side at C4 and above	Dec. 1949; calcified herniated disk at C5-C6 with cord compression	No improvement
J. A.	59	White	♂	Amyotrophic lateral sclerosis ruptured cervical disk(?)	1948	.....	Osteoarthritis most pronounced at C6, C7 with narrowing of intervertebral space C6-C7	Reported as normal; reevaluated as normal	Dec. 1949; calcified herniated disk at C6-C7 with cord compression	No improvement
B. Z.	43	White	♀	Multiple sclerosis(?), combined systems disease(?)	1948	86	Osteoarthritis C5-C6 with narrowing of intervertebral space at C5-C6	Significant filling defect at C5-C6 on right	Dec. 1949; calcified herniated disk at C5-C6; some disk material removed	Considerable improvement
J. R.	53	White	♂	Degenerative cord disease(?)	1948	85	Osteoarthritis greatest at C5, C6 with some narrowing of intervertebral space C5-C6	Thinning of pantopaque column at C5-C6 and for short distance above	Aug. 1949; calcified herniated disk at C5-C6 with cord compression	Considerable improvement

* The cerebrospinal fluid protein values were normal except as noted. † The spinal cord was decompressed and the dentate ligaments sectioned.

EXAMINATIONS AND LICENSURE

BOARDS OF MEDICAL EXAMINERS

ALABAMA: Montgomery, June 26-28. Sec., Dr. D. G. Gill, 519 Dexter Ave., Montgomery.

ARKANSAS: * *Regular.* Little Rock, June 14-15. Sec., Dr. Joe Verser, Harrisburg. *Homeopathic.* Fort Smith, June 7-8. Sec., Dr. Carl S. Bungart, 105 N. 14th St., Fort Smith. *Eclectic.* Little Rock, June 7-8. Sec., Dr. C. H. Young, 1415 Main St., Little Rock.

CALIFORNIA: *Written.* San Francisco, June 25-28 and Aug. 20-23. *Oral.* San Francisco, June 23 and Los Angeles, August 18. *Oral and Clinical Examination for Foreign Medical School Graduates.* San Francisco, June 24 and Los Angeles, August 19. Sec., Dr. Frederick N. Scatena, 1020 N St., Sacramento 14.

CONNECTICUT:* *Regular. Examination.* Hartford, July 10-11. Sec. to the Board, Dr. Creighton Barker, 160 St. Ronan St., Hartford. *Homeopathic.* Derby, July 11-12. Sec., Dr. Donald A. Davis, 38 Elizabeth St., Derby.

DELAWARE: Dover, July 10-12. Sec., Dr. J. S. McDaniel, 229 S. State St., Dover.

DISTRICT OF COLUMBIA:* *Reciprocity.* Washington, June 11. Sec., Dr. Daniel L. Seckinger, 4130 East Municipal Bldg., Washington.

FLORIDA:* *Examination.* Jacksonville, June 24-26. Sec., Dr. Homer L. Pearson, 701 DuPont Bldg., Miami.

GEORGIA: Atlanta, June. Augusta, June. Sec., Mr. R. C. Coleman, 111 State Capitol, Atlanta.

GUAM: The Commission on Licensure will meet whenever a candidate appears or submits his credentials. Ex. Sec., Dr. John Y. Battenfield, Agana.

HAWAII: *Examination.* Honolulu, July 9-12. Sec., Dr. I. L. Tilden, 1020 Kapiolani St., Honolulu.

IDAHO: Boise, July 9-11. Sec., Mr. Armand L. Bird, 305 Sun Bldg., Boise.

INDIANA: Indianapolis, June 20-22. Exec. Sec., Miss Ruth V. Kirk, 1138 K. of P. Bldg., Indianapolis 4.

IOWA: * *Written.* Iowa City, June 11-13. Sec., Dr. M. A. Royal, 506 Fleming Bldg., Des Moines.

KANSAS: Kansas City, June 6-7. Sec., Dr. O. W. Davidson, 864 New Brotherhood Building, Kansas City.

KENTUCKY: Louisville, June 6-8. Sec., Dr. Bruce Underwood, 620 S. 3rd St., Louisville.

LOUISIANA: New Orleans, June. Sec., Dr. Roy B. Harrison, 1507 Hibernia Bank Bldg., New Orleans 12.

MAINE: Augusta, July 10-11. Sec., Dr. Adam P. Leighton, 192 State St., Portland.

MARYLAND: Baltimore, June 19-22. Sec., Dr. Lewis P. Gundry, 1215 Cathedral St., Baltimore 1. *Homeopathic.* Baltimore, June 19-20. *Examination.* Sec., Dr. John A. Evans, 612 W. 40th St., Baltimore.

MASSACHUSETTS: *Examination.* Boston, July 10-13. Sec., Dr. Robert C. Cochrane, Room 37, State House, Boston 33.

MISSISSIPPI: Jackson, June. Asst. Sec., Dr. R. N. Whitfield, Jackson 113.

MISSOURI: St. Louis, May 31-June 1, June 7-9. Exec. Sec., Mr. John A. Hailey, Box 4, State Capitol Bldg., Jefferson City.

NEBRASKA: * June 1951. Director, Mr. Oscar F. Humble, Room 1009, State Capitol Bldg., Lincoln.

NEW HAMPSHIRE: Concord, Sept. 12-13. Sec., Dr. John Samuel Wheeler, Room 107 State House, Concord.

NEW JERSEY: *Examination.* Trenton, June 19-22. Sec., Dr. E. S. Hallinger, 28 W. State St., Trenton.

NEW YORK: Albany, Buffalo, New York and Syracuse, June 26-29. Sec., Dr. Jacob L. Lochner, Jr., 23 S. Pearl St., Albany 7.

NORTH CAROLINA: *Endorsement.* Raleigh, June 18-21. Sec., Dr. Joseph J. Combs, 419 Professional Bldg., Raleigh.

NORTH DAKOTA: Grand Forks, July 4-7. Sec., Dr. C. J. Glaspel, Grafton.

OHIO: *Examination.* Columbus, June 19-21. *Endorsement.* Columbus, April 3. Sec., Dr. H. M. Platter, 21 W. Broad Street, Columbus.

OKLAHOMA: * *Examination.* Oklahoma City, June 6-7. Sec., Dr. Clinton Gallaher, 813 Braniff Bldg., Oklahoma City.

PENNSYLVANIA: *Examination.* Philadelphia and Pittsburgh, July. Acting Sec., Mrs. M. G. Steiner, 351 Education Bldg., Harrisburg.

SOUTH CAROLINA: *Examination.* Columbia, June 25-27. *Reciprocity.* Columbia, April 2 and May 15. Sec., Dr. N. B. Heyward, 1329 Blanding St., Columbia.

SOUTH DAKOTA: Rapid City, July 17-18. Sec., Dr. Clarence E. Sherwood, 109 Center St., West, Madison.

TEXAS:* *Examination.* Austin, June 14-16. Sec., Dr. M. H. Crabb, 1714 Medical Arts Bldg., Fort Worth 2.

UTAH: Salt Lake City, July 11-13. Asst. Dir., Mr. Frank E. Lees, 324 State Capitol Bldg., Salt Lake City 1.

VERMONT: *Examination.* Burlington, June. Sec., Dr. F. J. Lawliss, Richford.

VIRGINIA: *Examination.* Richmond, June 14-16. Sec., Dr. K. D. Graves, 631 First St., S.W., Roanoke.

VIRGIN ISLANDS: St. Thomas, June 12. Sec., Dr. Earle M. Rice, St. Thomas.

WASHINGTON:* Seattle, July 16-18. Sec., Department of Licenses, Mr. Edward C. Dohm, Olympia.

WEST VIRGINIA: Charleston, July 9-11. Sec., Dr. N. H. Dyer, Capitol Bldg., Charleston 5.

WISCONSIN:* Milwaukee, July 10-12. Sec., Dr. C. A. Dawson, River Falls.

WYOMING: *Examination.* Cheyenne, June 4. Sec., Dr. Franklin D. Yoder, Capitol Bldg., Cheyenne.

BOARDS OF EXAMINERS IN THE BASIC SCIENCES

ALASKA: Juneau, August. Sec., Dr. C. Earl Albrecht, Box 1931, Juneau.

COLORADO: *Examination.* Denver, June 6-7. Sec., Dr. Esther B. Starks, 1459 Ogden St., Denver. 3.

CONNECTICUT: *Examination.* New Haven, June 9. Exec. Asst., Miss Mary G. Reynolds, State Board of Healing Arts, 110 Whitney Ave., New Haven.

FLORIDA: *Examination.* Gainesville, June 2. Sec., Mr. M. W. Emmel, University of Florida, Gainesville.

NEW MEXICO: *Examination.* Santa Fe, June 17. Sec., Miss Marguerite Cantrell, Box 1522, Santa Fe.

OREGON: *Examination.* Portland, June 2, Sept. 8 and Dec. 1. Sec., Dr. Charles D. Byrne, State Board of Higher Education, University of Oregon, Eugene.

SOUTH DAKOTA: *Examination.* Vermillion, June 15-16. Sec., Dr. Gregg M. Evans, 310 E. 15th St., Yankton.

TENNESSEE: *Examination.* Memphis, July 5-6. Sec., Dr. O. W. Hyman, 874 Union Ave., Memphis.

WASHINGTON: *Examination.* Seattle, July 11-12. Sec., Department of Licenses, Mr. Edward C. Dohm, Olympia.

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* Basic Science Certificate required.

MEETINGS

AMERICAN MEDICAL ASSOCIATION, Atlantic City, June 11 to 15. Dr. George F. Lull, 535 N. Dearborn St., Chicago 10, Secretary.

ALASKA TERRITORIAL MEDICAL ASSOCIATION, Ketchikan, May 31-June 2. Dr. William P. Blanton, Box 2569, Juneau, Secretary.

AMERICAN ASSOCIATION FOR THE STUDY OF NEOPLASTIC DISEASES, St. Agnes Hospital, Baltimore, June 7-9. Dr. Eugene R. Whitmore, 2139 Wyoming Ave. N. W., Washington 8, D. C., Secretary.

AMERICAN COLLEGE OF CHEST PHYSICIANS, Atlantic City, June 7-10. Mr. Murray Kornfeld, 500 N. Dearborn St., Chicago 10, Executive Secretary.

AMERICAN COLLEGE OF RADIOLOGY, Atlantic City, June 10. Mr. W. C. Stronach, 20 N. Wacker Drive, Chicago 6, Executive Secretary.

AMERICAN DIABETES ASSOCIATION, Chalfonte-Haddon Hall, Atlantic City, June 9-10. Dr. John A. Reed, 11 W. 42d St., New York 18, Secretary.

AMERICAN ELECTROENCEPHALOGRAPHIC SOCIETY, Hotel Claridge, Atlantic City, June 16-17. Dr. John A. Abbott, Massachusetts General Hospital, Boston 14, Secretary.

AMERICAN GASTRO-ENTEROLOGICAL ASSOCIATION, Atlantic City, June 8-9. Dr. Dwight L. Wilbur, 655 Sutter St., San Francisco 2, Secretary.

AMERICAN GERIATRICS SOCIETY, Hotel Brighton, Atlantic City, June 7-9. Dr. Malford W. Thewlis, 25 Mechanic St., Wakefield, R. I., Secretary.

AMERICAN HEARING SOCIETY, Palmer House, Chicago, June 29. Mrs. Frances E. Lee, 817 Fourteenth St. N.W., Washington 5, D. C., Secretary.

AMERICAN MEDICAL WOMEN'S ASSOCIATION, Hotel Dennis, Atlantic City, June 9-10. Dr. Mildred C. J. Pfeiffer, Woman's Medical College of Pennsylvania, Philadelphia 29, Secretary.

AMERICAN NEUROLOGICAL ASSOCIATION, Atlantic City, June 18-20. Dr. H. Houston Merritt, 710 W. 168th St., New York 32, Secretary.

AMERICAN OPHTHALMOLOGICAL SOCIETY, The Greenbrier, White Sulphur Springs, W. Va., June 7-9. Dr. Maynard C. Wheeler, 30 W. 59th St., New York 19, Secretary.

AMERICAN ORTHOPEDIC ASSOCIATION, The Greenbrier, White Sulphur Springs, W. Va., June 20-23. Dr. C. Leslie Mitchell, Henry Ford Hospital, Detroit 2, Secretary.

AMERICAN PROCTOLOGIC SOCIETY, Atlantic City, June 7-10. Dr. W. Wendell Green, 1838 Parkwood Ave., Toledo 2, Ohio, Secretary.

AMERICAN RADIUM SOCIETY, Atlantic City, June 6-9. Dr. John Wirth, U. S. Marine Hospital, Baltimore, Secretary.

AMERICAN RHEUMATISM ASSOCIATION, Hotel Dennis, Atlantic City, June 8-9. Dr. Charles Ragan, 620 W. 168th St., New York 32, Secretary.

AMERICAN SOCIETY FOR THE STUDY OF STERILITY, Ritz-Carlton Hotel, Atlantic City, June 9-10. Dr. John O. Haman, 490 Post St., San Francisco 2, Secretary.

AMERICAN THERAPEUTIC SOCIETY, Atlantic City, June 8-10. Dr. Oscar B. Hunter, 915 Nineteenth St. N.W., Washington 6, D. C., Secretary.

ASSOCIATION FOR THE STUDY OF INTERNAL SECRETIONS, Chalfonte-Haddon Hall, Atlantic City, June 7-9. Dr. Henry H. Turner, 1200 N. Walker St., Oklahoma City 3, Secretary.

CATHOLIC HOSPITAL ASSOCIATION OF THE UNITED STATES AND CANADA, Convention Hall, Philadelphia, June 2-5. Mr. M. R. Kneifl, 1402 S. Grand Blvd., St. Louis 4, Executive Secretary.

CONFERENCE OF PRESIDENTS AND OTHER OFFICERS OF STATE MEDICAL ASSOCIATIONS, Hotel Traymore, Atlantic City, June 10. Mr. John E. Farrel, 106 Francis St., Providence 3, R. I., Secretary.

GREAT FALLS MEDICAL-SURGICAL CONFERENCE, Great Falls, Montana, June 25-26. Dr. William E. Sullens, Box 1066, Great Falls, Chairman.

IDAHO STATE MEDICAL ASSOCIATION, Sun Valley, June 17-20. Dr. Robert S. McKean, 305 Sun Building, Boise, Secretary.

MAINE MEDICAL ASSOCIATION, Poland Spring House, Poland Spring, June 17-19. Dr. Frederick R. Carter, 142 High St., Portland 3, Secretary.

MEDICAL LIBRARY ASSOCIATION, Denver, June 28-30. Miss Caroline Riechers, Rush Medical College Library, 1758 W. Harrison St., Chicago 12, Secretary.

NATIONAL PROCTOLOGIC ASSOCIATION, Madison Hotel, Atlantic City, June 9. Dr. George E. Mueller, 1214 W. Beach Blvd., Biloxi, Miss., Executive Secretary.

SOCIETY FOR INVESTIGATIVE DERMATOLOGY, Ritz-Carlton Hotel, Atlantic City, June 7-8. Dr. Herman Beerman, 255 S. 17th St., Philadelphia, Secretary

SOCIETY FOR VASCULAR SURGERY, Chalfonte-Haddon Hall, Atlantic City, June 10. Dr. George D. Lilly, 333 Ingraham Bldg., Miami 32, Fla., Secretary.

SOCIETY OF AMERICAN BACTERIOLOGISTS, Chicago, May 28-June 1. Dr. John E. Blair, 1919 Madison Ave., New York 35, Secretary.

SOCIETY OF BIOLOGICAL PSYCHIATRY, Claridge Hotel, Atlantic City, June 17. Dr. George N. Thompson, 1136 W. Sixth St., Los Angeles 17, Secretary.

SOUTH DAKOTA STATE MEDICAL ASSOCIATION, Aberdeen, June 2-6. Dr. Roland G. Mayer, 22½ S. Main St., Aberdeen, Secretary.

WEST VIRGINIA STATE MEDICAL ASSOCIATION, The Greenbrier, White Sulphur Springs, July 19-21. Mr. Charles Lively, 1031 Quarrier St., Charleston 24, Executive Secretary.

INTERNATIONAL

EUROPEAN CONGRESS ON RHEUMATISM, Barcelona, Spain, Sept. 24-27. Dr. Gunnar Edström, Lund, Sweden, Secretary.

GENERAL PRACTITIONERS STUDY CLUB INTERNATIONAL, Rome, Italy, Sept. 12-15. Dr. John O'Connell, 10300 Lackland Road, St. Louis 14, Mo., U. S. A., President.

INTERNATIONAL ACADEMY OF PROCTOLOGY, Atlantic City, N. J., U. S. A., June 7-8. Dr. Alfred J. Cantor, 43-45 Kissena Blvd., Flushing, New York, Secretary.

INTERNATIONAL ANESTHESIA RESEARCH SOCIETY, London, England, Sept. 3-7. Mr. R. W. Cope, University College Hospital, London W.C.1, England.

INTERNATIONAL ASSOCIATION OF ALLERGISTS, Zurich, Switzerland, Sept. 23-29. Prof. A. S. Grumbach, Hygiene Institut der Universitaet Zurich, Gloriastr. 32, Zurich, Switzerland.

INTERNATIONAL CONGRESS OF ANESTHESIOLOGY, Nursing School of the Salpiettre, 47 Boul de l'Hospital, Paris, France, Sept 20-22. 12 rue de Seine, Paris 6e, France, Secretariat.

INTERNATIONAL CONGRESS OF CLINICAL PATHOLOGY, London, England, July 16-20. Dr. W. H. McMenemey, Maida Vale Hospital for Nervous Diseases, London W.9, England, Secretary.

INTERNATIONAL CONGRESS OF GYNECOLOGY, Maison de la Chimie, Centre Marcellin, Paris, France, June 23-29. Dr. Maurice Fabre, 1, rue Jules-Lefebvre, Paris IX, General Secretary.

INTERNATIONAL CONGRESS ON INDUSTRIAL MEDICINE, Instituto Superior Técnico, Lisbon, Portugal, Sept. 9-15. Dr. Luis Guerreiro, Instituto Nacional do Trabalho e Previdência, Praça do Comercio, Lisbon, Secretary General.

INTERNATIONAL CONGRESS ON MENTAL HEALTH, Mexico City, Mexico, Dec. 11-19.

INTERNATIONAL CONGRESS OF MILITARY MEDICINE AND PHARMACY, Paris, France, June 17-23. Physician General Dutrey, 8, bis, rue de Recollets, Paris X, Secretary General.

INTERNATIONAL EXHIBITION OF MEDICAL ARTS, Turin, Italy, May 30 June 12. Prof. S. Teneff, Palazzo della Exposizioni al Valentino, Turino, Italy.

INTERNATIONAL GERONTOLOGICAL CONGRESS, Hotel Jefferson, St. Louis, Mo., U. S. A., Sept. 9-14. Dr. John E. Kirk, 5600 Arsenal Street, St. Louis 9, Mo., Chairman, Program Committee.

INTERNATIONAL HOSPITAL CONGRESS, Brussels, Belgium, July 15-21. Capt. J. E. Stone, 10 Old Jewry, London E.C., England, Secretary.

INTERNATIONAL POLIOMYELITIS CONGRESS, Copenhagen, Denmark, Sept. 3-7. Prof. Dr. Niels Bohr, Statens Seruminstitut, 80 Amager Blvd., Copenhagen S., Denmark, President.

INTERNATIONAL SOCIETY OF ANGIOLOGY, Claridge Hotel, Atlantic City, N. J., U. S. A., June 9. Dr. Henry Haimovici, 105 E. 90th St., New York 28, Secretary.

INTERNATIONAL SOCIETY OF SURGERY, Paris, France, Sept. 24-29. Dr. L. Dejardin, 141, rue Belliard, Brussels, Belgium, Secretary General.

INTERNATIONAL SOCIETY FOR THE WELFARE OF CRIPPLES, Fifth World Congress, Stockholm, Sweden, Sept. 9-14. Mr. Donald V. Wilson, 54 E. 64th St., New York 21, N. Y., U. S. A., Executive Director.

PAN PACIFIC SURGICAL ASSOCIATION CONGRESS, Honolulu, Hawaii, Nov. 7-19. Dr. Forrest J. Pinkerton, Suite 7, Young Bldg., Honolulu, Hawaii, President.

STUDENTS' INTERNATIONAL CLINICAL CONGRESS, Leyden, Utrecht, Groningen and Amsterdam, Holland, July 10-28. N. A. M. Bergstein, Oude Gracht 143 bis, Utrecht, Holland, Secretary General.

WORLD CONFEDERATION FOR PHYSICIAL THERAPY, Copenhagen, Denmark, Sept. 7-8.

WORLD MEDICAL ASSOCIATION, Stockholm, Sweden, Sept. 15-21. Dr. Louis H. Bauer, 2 E. 103d St., New York 29, N. Y., U. S. A., Secretary-General.

DEATHS

Brackett, Edward Sumner ✦ Providence, R. I.; born in 1875; Yale University School of Medicine, New Haven, Conn., 1902; member and past president of the New England Obstetrical and Gynecological Society; past president and vice president of the Rhode Island Medical Society; past president of the Providence Medical Society and Rhode Island Birth Control League; past president of the Yale Association of Rhode Island; vice president of the Hospital Service Corporation of Rhode Island; consulting obstetrician, Providence Lying-In Hospital, where he had been chief of staff; consulting gynecologist, Miriam and Rhode Island hospitals; consulting gynecologist South County Hospital in Wakefield and the Memorial Hospital in Pawtucket; died in the Jane Brown Memorial Hospital March 1, aged 75, of pulmonary emphysema and bronchiectasis.

Blackburn, John Henry ✦ Bowling Green, Ky.; born in Woodburn, Ky., Aug. 7, 1876; Vanderbilt University School of Medicine, Nashville, Tenn., 1899; member of the Southeastern Surgical Congress; fellow of the American College of Surgeons; in 1932 member of the House of Delegates of the American Medical Association; past president of the Kentucky State Medical Association, of which he had been councilor, the Warren County Medical Society, and the Third District Medical Society; past member of the state board of health; served during World War I; affiliated with Bowling Green City Hospital; director of the American National Bank; died Feb. 17, aged 74, of coronary occlusion.

Abbott, Theodore Jacob ✦ Cornwall-on-the-Hudson, N. Y.; Columbia University College of Physicians and Surgeons, New York, 1900; an Associate Fellow of the American Medical Association; served in France during World War I; formerly clinical professor of medicine at University-Bellevue Medical Center, New York, where he was affiliated with Bellevue Hospital and consultant to the U. S. Veterans Bureau and the Hospital for Special Surgery; died March 1, aged 78, of heart disease.

Anderson, Jesse James, Jacksonville, Fla.; Chicago Medical School, 1926; served during World War I; died in the Veterans Administration Hospital, Bay Pines, March 8, aged 56.

Bagli, Francis Lucian, Baltimore; University of Maryland School of Medicine and College of Physicians and Surgeons, Baltimore, 1921; member of the American Medical Association; died March 12, aged 55.

Bartlett, Ezekiel Merrell, Clarksville, Mo.; University of Louisville Medical Department, 1900; member of the American Medical Association; on the staff of Pike County Hospital in Louisiana; died March 15, aged 73, of coronary occlusion and generalized arteriosclerosis.

Blackstone, Alfred Varney ✦ Absarokee, Mont.; Harvard Medical School, Boston, 1907; served as health officer; affiliated with Stillwater Community Hospital in Columbus; died March 7, aged 71, of cerebral hemorrhage.

Blumer, Frederick William, Lincoln, Neb.; Lincoln Medical College of Cotner University, 1908; veteran of the Spanish-American War; medical examiner during World War I; died in the Veterans Administration Hospital March 5, aged 70, of coronary occlusion.

Bryant, William Cullen, Chouteau, Okla.; Memphis Hospital Medical College, 1900; member of the American Medical Association; died in Muskogee March 8, aged 84, of carcinoma of the prostate.

Buckmann, Henry D., Martinez, Calif.; Cooper Medical College, San Francisco, 1908; an honorary member of the staff of Community Hospital; member of the American Medical Association; died March 7, aged 68, of carcinoma of the tongue.

Burgett, Warren Eugene ✦ Bement, Ill.; Kentucky School of Medicine, Louisville, 1886; died in March, aged 85.

Clark, Carl Wesley ✦ San Rafael, Calif.; Rush Medical College, Chicago, 1915; died in the Southern Pacific Hospital, San Francisco, Feb. 10, aged 62, of cerebral thrombosis.

Dixon, Garvin Jonathan, St. Louis; Meharry Medical College, Nashville, Tenn., 1916; on the staffs of the Homer G. Phillips Hospital, St. Mary's Infirmary and People's Hospital; served as magistrate of the Third District; died March 5, aged 63, of cerebral hemorrhage.

Elmer, Robert Potter, Wayne, Pa.; University of Pennsylvania Department of Medicine, Philadelphia, 1902; member of the American Medical Association; author of "Archery" and coauthor of several books on the sport; on the courtesy staff of Bryn Mawr (Pa.) Hospital, where he died March 4, aged 73, of myocardial infarction.

Estey, Guy W., Miami, Fla.; Middlesex College of Medicine and Surgery, Cambridge, Mass., 1918; died in Miami Hospital Feb. 23, aged 63, of coronary thrombosis.

Faucett, Samuel Thompson, Kirkland, Wash.; Columbia University College of Physicians and Surgeons, New York, 1903; died in the Marine Hospital, Seattle, Jan. 22, aged 71, after a sympathectomy.

Fleury, Oswald Theodore ✦ Holyoke, Mass.; Tufts College Medical School, Boston, 1919; fellow of the American College of Surgeons; affiliated with Holyoke and Providence hospitals; died March 1, aged 56, of coronary thrombosis.

Jordan, William Mudd, Birmingham, Ala.; Columbia University College of Physicians and Surgeons, New York, 1895; member of the Southern Surgical Association; fellow of the American College of Surgeons; veteran of Spanish-American War and World War I; died in St. Vincent's Hospital Feb. 6, aged 77, of rupture of the esophageal varix and cirrhosis of the liver.

Kerr, Alvin Robert, Attica, Ind.; Indiana University School of Medicine, Indianapolis, 1910; member of the American Medical Association; served in France during World War I; on the staff of Community Hospital, Williamsport; on the courtesy staff of St. Elizabeth Hospital, Lafayette; died in Veterans Administration hospital, Indianapolis, March 11, aged 69, of cerebral hemorrhage.

Lamb, Lloyd Lewit, Zephyrhills, Fla.; Hospital Medical College, Eclectic, Atlanta, 1911; died Feb. 12, aged 81, of cerebral hemorrhage and arteriosclerosis.

Lanham, Logan Taylor, Mount Olivet, Ky.; University of Louisville School of Medicine, 1930; member of the American Medical Association; chairman of the school board; died Feb. 3, aged 44, of heart disease.

McKechnie, Frederick Joseph, Springfield, Mass.; Harvard Medical school, Boston, 1900; member of the American Medical Association; served during World War I; at one time practiced in New York, where he was appointed medical advisor to the New York Board of Health and was a member of the staffs of the New York Ear and Eye Infirmary and the Manhattan Eye, Ear and Throat Hospital; a member and at one time president of the staff, Mercy Hospital; died March 6, aged 76, of coronary thrombosis.

Maulding, Homer Ray, Atlanta; University of Georgia School of Medicine, Augusta, 1935; member of the American Medical Association; died March 3, aged 42, of cerebral thrombosis.

Miller, Lloyd T., Yazoo City, Miss., Meharry Medical College, Nashville, Tenn., 1893; died March 8, aged 76, of cerebral hemorrhage.

Moore, Sair C., Cadillac, Mich.; Detroit College of Medicine, 1899; member of the American Medical Association and the American Public Health Association; served as health commissioner of Wexford County and as president of the board of education; formerly mayor of Cadillac; affiliated with Mercy Hospital, where he died March 4, aged 76, of diabetes mellitus.

✦ Indicates Fellow of the American Medical Association.

Morden, Charles Bowman, Bad Axe, Mich.; University of Michigan Department of Medicine and Surgery, Ann Arbor, 1903; past president of the Huron County Medical Society; chief of staff, Hubbard Memorial Hospital from 1919 to 1946; died March 5, aged 71, of chronic myocarditis and diabetes mellitus.

Murphy, Raymond James ✠ Chicago; Loyola University School of Medicine, Chicago, 1926; served during World War I; died March 2, aged 52, of chronic myocarditis.

Norris, Claude Bazil, Riverside, Calif.; University of Oklahoma School of Medicine, Oklahoma City, 1921; specialist certified by the American Board of Dermatology and Syphilology; member of the House of Delegates of the American Medical Association, 1939, 1940, and 1941; at one time practiced in Youngstown, Ohio, where he was president of the Mahoning County Medical Society and on the staff of the Youngstown Hospital; at one time editor of the *Bulletin of the Mahoning County Medical Society;* died March 6, aged 62, of cerebral occlusion.

Paynter, Lawrence W. ✠ Salem, Ind.; University of Louisville Medical Department, 1893; served as county coroner; died in the Washington County Hospital March 5, aged 79, of coronary thrombosis.

Quisling, Gunnar D. ✠ Madison, Wis.; University of Illinois College of Medicine, Chicago, 1932; served during World War II and received the Legion of Merit; one of the founders of the Quisling Clinic; died March 18, aged 41, of sarcoma of the lung.

Reams, Bernard L., Richmond, Va.; Medical College of Virginia, Richmond, 1894; died Jan. 19, aged 78.

Recca, John, New York; New York Homeopathic Medical College and Flower Hospital, New York, 1917; served on the staffs of Flower and Fifth Avenue Hospitals, Hospital for Joint Diseases, and Babies Hospital; died Feb. 25, aged 58, of coronary thrombosis.

Reiss, George Samuel ✠ Long Beach, N. Y.; Georgetown University School of Medicine, Washington, D. C., 1914; fellow of the International College of Surgeons; served during World War I; medical director of the Long Beach Memorial Hospital, where he died March 2, aged 58, of coronary thrombosis.

Rosner, John Dory, Cornwall-on-the-Hudson, N. Y.; Medizinische Fakultät der Universität, Wien, Austria, 1906; member of the American Medical Association; served on the surgical staff of the Cornwall (N. Y.) Hospital, where he died Feb. 20, aged 69, of subdural hemorrhage.

Schoenfeld, John Burton, Birmingham, Mich.; University of Michigan Medical School, Ann Arbor, 1930; member of the American Medical Association; served in the South Pacific during World War II; formerly physician at Cranbook School in Bloomfield Hills; member of the staffs of Harper Hospital in Detroit and St. Joseph Mercy Hospital in Pontiac; died Feb. 24, aged 45, of myocardial infarction.

Schuettler, Arthur Frederick, East St. Louis, Ill.; Bennett Medical College, Chicago, 1915; died March 22, aged 61, of acute pulmonary edema.

Shaw, Arthur Ernest ✠ Columbia, S. C.; Jefferson Medical College of Philadelphia, 1905; died Feb. 8, aged 75, of coronary thrombosis.

Spangler, Charles Anthony ✠ Perkasie, Pa.; University of Pennsylvania School of Medicine, Philadelphia, 1931; vice president of the Bucks County Medical Society; served during World War II; director of the Bucks County Mental Health Society; affiljated with Grandview Hospital in Sellersville and the Quakertown (Pa.) General Hospital; died March 2, aged 45, of coronary thrombosis.

Spruce, Clifford Judson, Chicago; Jenner Medical College, Chicago, 1907; died in West Suburban Hospital, Oak Park, March 18, aged 81, of coronary thrombosis.

Tomlinson, Robert Williams, Wilkes-Barre, Pa.; Jefferson Medical College of Philadelphia, 1912; formerly practiced in Wilmington, Del., where he served as president of the New Castle County Medical Society; died in General Hospital March 1, aged 67, of cerebral thrombosis.

Waddell, Jesse Clyde, Paton, Iowa; Keokuk (Ia.) Medical College, College of Physicians and Surgeons, 1907; member of the American Medical Association; affiliated with St. Joseph Mercy Hospital and Lutheran Hospital in Fort Dodge, where he died March 20, aged 69, of heart failure.

Wallace, William Lindsey ✠ Hong Kong, China; University of Tennessee College of Medicine, Memphis, 1932; served an internship and residency at Knoxville General Hospital, Knoxville, Tenn.; member of the Tennessee State Medical Association; attached to the American Southern Baptist Mission; served with the Mission Stout Memorial Hospital in Wuchow, Kwangsi, China; died in a Chinese Communist prison Feb. 10, aged 43.

Waller, Benjamin S., Silver Creek, Miss.; Louisville Medical College, 1897; member of the American Medical Association; past president of the Laurence County Medical Society; died March 20, aged 81.

Welles, Charles Newton, Carlsbad, Calif.; Cleveland Homeopathic Medical College, 1904; died Feb. 14, aged 81, of ulcer of the stomach.

Wheeler, Casabianca C., Paintsville, Ky.; Hospital College of Medicine, Louisville, 1904; died in a Detroit hospital Feb. 21, aged 78.

White, Howard King ✠ Philadelphia; Hahnemann Medical College and Hospital of Philadelphia, 1909; received two citations for meritorious service in the Meuse-Argonne area during World War I; during World War II, chief medical examiner for Draft Board No. 20; on the courtesy staff of Memorial and Hahnemann hospitals; died Jan. 3, aged 67, of coronary occlusion.

White, Michael William ✠ Somerville, Mass.; Harvard Medical School, Boston, 1898; on the staff of Somerville Hospital, where he died Jan. 1, aged 78, of cerebral hemorrhage.

Whittaker, Howard, Philadelphia; Hahnemann Medical College and Hospital of Philadelphia, 1905; on the courtesy staff of Hahnemann Hospital; died March 23, aged 68, of cerebral hemorrhage.

Williamson, Joseph Patterson ✠ Winter Park, Fla.; Medical College of the State of South Carolina, Charleston, 1928; member of the American Association of Industrial Physicians and Surgeons; served during World War II; on the staff of Orange Memorial Hospital in Orlando; died in Orlando Feb. 2, aged 50, of carcinoma.

Willis, Arthur Ponder, Candler, N. C.; University of North Carolina School of Medicine, Chapel Hill, 1904; member of the American Medical Association; formerly chairman of the board of health of Canton; died in Ashton Park Hospital, Asheville, Feb. 27, aged 71, of hypertensive heart disease and arteriosclerosis.

Wilson, M. Sylvia McQuitty, Clearwater, Fla.; Boston University School of Medicine, 1893; formerly associated with the U. S. Public Health Service; died Jan. 22, aged 85, of coronary thrombosis.

Winford, Thomas Edgar, Dallas, Texas; Baylor University College of Medicine, Dallas, 1920; member of the American Medical Association; awarded the W. H. Adamson Trophy in Oak Cliff in 1943 for child welfare work; on the staff of Dallas Methodist Hospital; died March 7, aged 58.

Winters, Christian, Fort Wayne, Ind.; Fort Wayne College of Medicine, 1891; died March 23, aged 87.

Wolfe, Thomas Lindly, Mount Vernon, Iowa; Kentucky School of Medicine, Louisville, 1891; died Feb. 13, aged 81, of cerebral sclerosis.

Worley, Charles Leslie ✠ Ottumwa, Iowa; State University of Iowa College of Medicine, Iowa City, 1933; president of the Wapello County Medical Society; served during World Wars I and II; on the staff of Ottumwa Hospital and St. Joseph Hospital, where he died March 17, aged 52, of coronary occlusion.

Yerby, Leonard Donald, Long Beach, Calif.; University of California Medical School, San Francisco, 1939; died recently, aged 36, of pulmonary tuberculosis.

GOVERNMENT SERVICES

ARMY

Consultants to Inspect Installations in Europe.—Three medical specialists who will be in Europe this summer have volunteered to inspect army medical service installations in the European Command as consultants to the Army surgeon general. Dr. Paul Magnuson, Chicago, until recently medical director of the Veterans Administration, and Dr. Rex Diveley, Kansas City, Mo., plan to visit orthopedic patients and to check on orthopedic service in Army hospitals. Dr. Paul Titus, Pittsburgh, secretary and treasurer of the American Board of Obstetrics and Gynecology, will confer with Army officers on duty at various hospitals. All three specialists will go to Europe to attend meetings relating to their fields of specialization.

Nurse Recruitment Goal.—The American Medical Association and the American Hospital Association have indorsed the expansion goal of 3,000 additional nurses for the Army nurse corps, Maj. Gen. Raymond W. Bliss, the Army's surgeon general, announced May 7.

Dr. George F. Lull, Secretary and General Manager of the American Medical Association, has advised that its Board of Trustees approves the nurse recruitment program and will bring it to the attention of the medical profession through THE JOURNAL.

Dr. Charles F. Wilinsky placed the American Hospital Association, of which he is president, on record as being wholeheartedly in support of the Army's current nurse expansion program. There are approximately 4,700 nurses in the Army nurse corps today.

VETERANS ADMINISTRATION

New Hospital Managers.—Dr. Michael L. Matte, presently manager of the Veterans Administration hospital in Fort Logan, Colo., has been appointed manager of a new 500 bed Veterans Administration hospital scheduled to open in Denver in July. Dr. Matte came to VA in 1937.

Dr. Earl H. Hare, manager of the Cold Spring Road VA Hospital in Indianapolis, has been named manager of the 500 bed VA hospital under construction in the same city. Dr. Hare has been with the VA since 1922.

Dr. Louis V. J. Lopez, manager of the Veterans Administration hospital at Fort Meade, S. D., has been appointed manager of the VA hospital at Canandaigua, N. Y., succeeding Dr. Nils B. Hersloff, resigned. Dr. Lopez will be succeeded at Fort Meade by Dr. Frederick J. Bradshaw Jr., presently chief of professional services at the VA hospital, Gulfport, Miss.

Dr. Clifton H. Smith, manager of the Veterans Administration Peachtree Road Hospital in Atlanta, Ga., has been named manager of the VA Cold Spring Road hospital in Indianapolis, succeeding Dr. Earl Hare. The Cold Spring Road hospital will be converted to a tuberculosis from a general medical and surgical hospital following the opening of the new 500-bed general hospital late this year.

Dr. Hugh L. Prather, chief of professional services at Memphis Veterans Administration Hospital, has been appointed manager of the hospital, to succeed Dr. Clyde M. Beck, who resigned. Dr. Prather served in the regular Army medical corps from 1928 to 1946, when he joined VA.

Dr. Seymour Fisher has been appointed manager of the new 192 bed hospital in Phoenix, Ariz., which is to be dedicated June 10, 1951. Dr. Fisher, formerly chief of professional services at the Veterans Administration hospital at Fort Benjamin Harrison, Ind., joined VA in August, 1946.

Personal.—Dr. Howard D. Fabing of Cincinnati has resigned as consultant in neurology for the Washington Area Office of the Department of Medicine and Surgery of the Veterans Administration.

PUBLIC HEALTH SERVICE

Examination for Medical Officers.—A competitive examination for appointment of medical officers in the regular corps of the United States Public Health Service will be held September 4 to 6 at a number of points throughout the United States. Applications must be received no later than August 6. The regular corps is a commissioned officer corps composed of members of various medical and scientific professions. Appointments will be made in the grades of assistant surgeon, equivalent to the Navy rank of lieutenant (j. g.), and senior assistant surgeon, equivalent to lieutenant. In making assignments, consideration is given to the officer's preference, ability, and experience; however, all commissioned officers are subject to change of station and assignment as necessitated by the needs of the service. Appointments are permanent in nature and provide opportunities to qualified physicians for a life career in clinical medicine, research, and public health.

Requirements to be met by candidates are as follows:

Both grades.—United States citizenship; at least 21 years of age, and graduation from a recognized school of medicine.

Assistant surgeon.—At least seven years' educational training and professional experience subsequent to high school.

Senior assistant surgeon.—At least 10 years' educational training and professional experience subsequent to high school.

Applicants who will complete these requirements within nine months of the date of the written examination will be admitted but may not be appointed until they meet the above requirements. Physicians who are successful in the examination and are now serving internships will not be placed on active duty in the regular corps until completion of internship. The examination will include an oral interview, physical examination, and written objective tests covering the professional field.

Entrance pay for an assistant surgeon with dependents is $5,686.56 per annum; for senior assistant surgeon with dependents, $6,546. These figures include the $1,200 annual additional pay received by medical officers as well as subsistence and rental allowance. Officers on active duty are not eligible to receive disability compensation from the Veterans Administration.

Retirement pay after 30 years of service or at the age of 64 is three-fourths of the annual basic pay at the time of retirement. Retirement for disability is authorized under the Career Compensation Act, and minimum disability retirement pay is ordinarily one-half of the annual basic pay at the time of retirement. Additional benefits include periodic pay increases (time served as a member of the armed forces is credited), 30 days annual leave, sick leave, full medical care, and the usual privileges extended to officers of the military forces.

Application forms may be obtained from the Surgeon General, U. S. Public Health Service, Washington 25, D. C. Attention: Division of Commissioned Officers.

Survey of Medical School of Formosa.—Dr. George H. Humphreys, professor of surgery, College of Physicians and Surgeons, and Dr. Magnus I. Gregerson, professor of physiology, at Columbia University, New York, have been given special assignments to the ECA Mission to Formosa. As part of a study sponsored by the Public Health Service and the Economic Cooperation Administration, they are conducting separate surveys of medical education at the Medical School of Formosa to determine methods by which medical teaching in Formosa might be improved. The surveys include reviews of the curriculum and teaching facilities and the requirements of the school for specialists in public health and medical education. Drs. Humphreys and Gregerson will prepare a single report of their findings. This is expected to be used by the Public Health Service, the Economic Cooperation Administration and Columbia University as the basis for furnishing specialized teaching personnel and other assistance to the Medical School of Formosa.

Federal Millions for Cancer Research.—The program of federal aid begun in 1947 for expanding cancer research facilities throughout the country is on its way to completion, the federal security administrator announced April 24. Since inauguration of the program, the Public Health Service has awarded $16,303,000 to aid cancer research construction projects at nonfederal institutions. Forty-seven medical schools, hospitals and medical research centers have received grants to build and equip laboratories and clinics for cancer studies. Money for this phase of the program was set aside by Congress before the outbreak of the Korean war. No new grants are being awarded during the current fiscal year.

Established in 1947 by Congress to speed the attack on cancer, the program is under the supervision of Dr. John R. Heller, director of the National Cancer Institute. Grants are recommended by the National Advisory Cancer Council and are awarded by Dr. Leonard A. Scheele, surgeon general of the Public Health Service. Lists of completed projects and projects under construction follow.

COMPLETED PROJECTS

Medical College of Alabama and Jefferson County Health Department, Birmingham, $47,280. Used to build laboratories for studies of diagnostic tests for cancer.

County Hospital, Los Angeles, $35,255. Converted an old jail hospital building to a cancer research laboratory.

George Washington University, Warwick Clinic for Cancer and Allied Diseases, Washington, D. C., $50,000. Provided equipment and laboratories for cancer research.

Georgetown University medical school, Washington, D. C., $148,500. Added laboratories and equipment for cancer research at the medical school and hospital.

University of Chicago, Goldblatt Memorial Hospital for Cancer Research, Chicago, $690,000. Paid for two and one-half floors of laboratories and clinical research facilities in new seven story building devoted to cancer research.

State University of Iowa, Iowa City, $12,250. Modified laboratories for radioisotope studies in cancer.

Jackson Memorial Laboratory, Bar Harbor, Maine, $350,000. Contributed to the rebuilding of two large laboratory units used in important genetic studies in cancer.

Boston University school of medicine, Boston, $62,750. Built laboratories and enlarged buildings for experimental animals used in cancer research.

Tufts College medical school, Boston, $133,522. Grant used in constructing and equipping cancer research laboratories, in remodeling clinical cancer research facilities in two affiliated hospitals and in constructing units for experimental animals used in cancer studies.

Columbia University College of Physicians and Surgeons, New York, $1,000,000. Provided one half of the construction and equipment costs of four floors of large new research unit for investigations of many phases of the cancer problem.

University of Rochester, Rochester, N. Y., $434,368. Used for construction of three floors of addition to school of medicine to provide improved facilities for cancer research.

University of Oregon medical school, Portland, $10,000. Alterations to provide an isotope laboratory for cancer research.

Institute for Cancer Research, Philadelphia, $198,468. Bought technical equipment for new Institute for Cancer Research.

University of Pennsylvania, Philadelphia, $56,208. Remodeled cancer laboratories and bought new equipment for cancer research in the medical school's pathology department.

Medical College of the State of South Carolina, Charleston, $16,000. Built additional units for experimental animals used in cancer investigations.

Meharry Medical College, Nashville, Tenn., $50,385. Two projects, one to build and equip laboratories for cancer research and a second to provide quarters for experimental animals used in the cancer program.

Medical College of Virginia, Richmond, $10,588. Remodeling and equipment for clinical research in cancer.

PROJECTS UNDER CONSTRUCTION

University of California medical school, San Francisco, $1,000,000. To provide laboratories and clinical research facilities for a cancer research institute in new multimillion dollar medical center.

University of Colorado, Denver, $400,000. To pay for much of the construction of a five story cancer research building adjoining the hospital and medical school.

Yale University, New Haven, Conn., $250,000. To provide new animal laboratory needed for expansion of cancer research program.

George Washington University, Washington, D. C., $200,000. To construct cancer research laboratories in association with new facilities for the Warwick Memorial Clinic.

Emory University, Atlanta, $500,000. To build and equip cancer laboratories in new research center connected to hospital.

Loyola University Stritch School of Medicine, Chicago, $47,300. Alterations to provide laboratory for radioisotope studies.

University of Kansas, Kansas City, Kan., $200,000. To add cancer research laboratories in new building for pathology, bacteriology and pharmacology departments.

Johns Hopkins University, Baltimore, $750,000. To construct cancer research section of new research building.

Beth Israel Hospital, Boston, $50,000. To construct animal laboratory for cancer studies.

The Children's Medical Center, Boston, $100,000. To buy equipment for research building erected by Children's Cancer Research Foundation.

Massachusetts General Hospital, Boston, $700,000. To construct cancer laboratories in new research building housing laboratories for arthritis and cardiovascular studies.

New England Deaconess Hospital, Boston, $485,000. To construct four story laboratory building for use of Harvard Cancer Commission, State Tumor Diagnosis Service and others in cancer research, experimental cancer detection clinic.

Wayne University College of Medicine, Detroit, $250,000. To construct and equip cancer laboratory in new addition to Detroit Receiving Hospital.

University of Minnesota, Minneapolis, $879,438. To build cancer laboratories in Mayo Memorial Center and large clinical research unit in University Hospital.

Washington University, St. Louis, $250,000. To assist in constructing new hospital to include facilities for clinical research in cancer.

Duke University, Durham, N. C., $200,000. To add to research building cancer laboratories for leukemia and radioisotope studies.

University of North Carolina, Chapel Hill, $200,000. To construct cancer research laboratories in new outpatient and clinical research building.

Oklahoma Medical Research Foundation, Oklahoma City, $125,000. To provide cancer research facilities in new medical research institute at the University of Oklahoma.

University of Tennessee Medical School, Memphis, $491,584. To construct four story laboratory building for cancer research.

University of Texas, Houston, $300,000. To construct cancer research laboratories as part of the new $5,500,000 M. D. Anderson Hospital.

University of Utah School of Medicine, Salt Lake City, $416,404. To construct laboratory building for cancer research in new medical center.

University of Virginia School of Medicine, Charlottesville, $75,000. To build laboratories centralizing cancer research now carried on in scattered clinics and laboratories.

University of Wisconsin, Madison, $975,000. To construct clinical cancer research units needed to consolidate clinical and laboratory studies.

Report on Water Pollution.—A newly-published report on water pollution in the United States sets forth the first national summaries of data from initial state and federal studies for the development of comprehensive pollution abatement programs for the nation's waterways. They indicate that public and private investments of 9 million to 12 million dollars will be required during the next decade to meet present needs for 10,000 new waste treatment plants, replacements, additions or enlargements, and to keep up with future industrial expansion and population growth. Surgeon General Leonard A. Scheele pointed out that the 10,000 new waste treatment plant projects that are known to be necessary represent only a part of present needs; still undetermined are the needs of 1,600 municipalities and 5,500 industries that were not covered by the study.

The state and federal cooperative studies to date show a total of more than 22,000 sources of pollution in the United States. These are divided nearly equally between 11,800 municipal sewer systems and 10,400 independent factory waste outlets. Despite the reduction of pollution by 9,300 treatment plants now operating—6,700 municipal and 2,600 industrial plants—wastes discharged into rivers and lakes are equivalent to those from a population of over 150,000,000.

The studies disclose that the 11,811 municipal sewer systems throughout the country serve populations totaling 91,762,000, but only 6,628 of these systems serving about 46,500,000 people have sewage treatment plants. Out of 10,401 industries independently discharging wastes into waterways, 2,595 treat their wastes, but 3,659 do not. Comparable information is not available for 4,147 other industrial establishments.

As of July 1, 1950, there were over 400 treatment plants under construction, of which 326 were municipal projects and 114 for industry. At that time final plans had been approved for 854 additional municipal treatment plants and 124 industrial treatment plants. This increase, however, did not begin to meet waste disposal problems brought about by an unexpected increase in population and increased industrial production.

Responsibility for controlling water pollution rests with local communities and those industries responsible for industrial pollution, the report emphasizes. But in a number of states, according to the report, the widespread nature of pollution problems has impelled the state government to make money available to municipalities for the construction of public sewage treatment works.

FOREIGN LETTERS

PARIS

Kidney Transplantation.—Servelle, P. Soulié, J. Rougeulle, C. Delahaye and Touche have been studying transplantation of the kidneys of dogs. The first of the 20 transplantations consisted only in the removal of a kidney and its attachment to the blood vessels of another dog. Later, improving their method, they could make renal grafts with secretion for a few weeks, studied by connecting the urethra with the skin. In the dog, they regularly noted ascending pyelitis, pyelonephritis and the destruction of the kidney. Furthermore, the total disappearance of the kidney was noted, almost nothing remaining except an artery or a vein with thrombosis. They have just accomplished the first transplantation of an executed criminal's kidney into a 22 year old female patient with hypertensive azotemic nephritis and albuminuria (5 gm.). In 1949, exploration of the right iliac fossa showed absence of the kidney and urethra, and section of the right splanchnic nerve and a lumbar sympathectomy were performed. Examination previous to transplantation showed a slight mesocardiac systolic murmur; radiography disclosed significant left hypertrophy; the erythrocyte count was 1,900,000, leukocyte count 15,000 (88% polymorphonuclear neutrophils), and hemoglobin 70%. The absence in the urine of red cells, pus, casts and bacteria was noted. Blood urea was 3 gm. per 1,000; the alkaline reserve was 54%.

The donor's kidney was taken within minutes after the execution, immediately perfused with Ringer's solution and kept at constant temperature till arrival at the hospital, where a second surgical team had prepared the patient. There was no hypogastric artery; the iliac artery was abnormally long. The iliac vein was in its normal place and was cut under the arch after ligature and clamping. The renal vein was anastomosed end to end; then the renal artery was anastomosed terminolaterally on the external iliac artery. After removal of arterial clamps, the artery pulsates and dilates; thus blood circulation is resumed through the kidney. The urethra is connected with the skin (a urethral catheter in its interior); urine then flows drop by drop.

The postoperative condition was normal for 48 hours: there was 20 cc. of urine on the first day and 30 cc. on the second. On the third day, acute pulmonary edema appeared, which subsided under the influence of bloodletting and cardiotonics associated with oxygen. Urinary secretion increased progressively, reaching 120 cc. on the 15th day. The patient's general condition was good; she could eat and drink. The fibrin that had been observed in the urine since the third day disappeared. On the 16th day, urinary secretion reached 192 cc. To compensate for the elimination of chlorides, 250 cc. of isotonic sodium chloride solution was injected subcutaneously; this provoked a violent shock, which subsided within a few hours. On the 19th day, the urinary secretion of the grafted kidney reached 600 cc. per day, the patient refused to eat; her psychic condition suggested chloropenia. A very slow subcutaneous injection of isotonic sodium chloride solution was given; the first 150 cc. was well tolerated, but, by the end of the administration of the 250 cc., shock with pallor, fall of blood pressure, and other deleterious changes occurred, improved on administration of citrated blood but reappeared later and provoked death.

At autopsy it was observed that the grafted kidney was normal both in volume and in appearance; the other kidney had the volume of a tangerine. Notwithstanding the fatality (for which the injections of the saline solution were partly responsible) the authors believe that such transplantation may be helpful and that in a patient with a less impaired condition, the postoperative effects would not have been so complicated.

The foregoing report was made at a meeting of the Medical Society of the Paris Hospitals (Jan. 26, 1951), at which C. Dubost, N. Oeconomos, J. Vaysse, J. Hamburger, P. Milliez and J. Lebrigand also reported on kidney transplantation, performed in two cases. Their first patient was a 44 year old woman who had a right nephrectomy for renal tuberculosis and for years had had hypertensive, edematous, azotemic nephritis in the remaining kidney. On Jan. 12, a kidney was grafted on the right iliac vessels with cutaneous ureterostomy. On the 14th day after the operation, the urinary secretion of the grafted kidney reached 230 cc.; urea 12 gm., and chlorine 0.86 gm.; there was no glycosuria.

The other patient was a 20 year old woman who for 12 years had had glomerulonephritis with progressive albuminuria and azotemia. Recent aggravation and a state of torpor necessitated a renal graft, performed on the right iliac vessels with cutaneous ureterostomy. During the first days, the grafted kidney secreted a few cubic centimeters of clear urine; blood urea was 3.40 gm. and urinary urea 9.5 gm. (no glycosuria). It is still too early to foretell the future in these two cases; the authors will report results later.

Urban and Rural Tuberculosis.—Dr. G. Cuvier, technical adviser of the Central Funds of the Social Agricultural Mutuality, taking the statistics of the National Institute of Hygiene as a basis, made a comparative study of the evolution of tuberculosis in urban and rural environments. This study embraces two periods: (*a*) from 1931 to 1935 and (*b*) from 1945 to 1948. The average per 10,000 inhabitants was established. For the period 1931-1948, the total number of new cases of tuberculosis registered by dispensaries diminished in urban environments from 113.4 to 108.15 and increased in rural environments from 50.75 to 56.10. Among patients the number of pulmonary cases diminished in urban environments from 73 to 43.60 and in rural environments from 32.90 to 25.50. Other forms of tuberculosis appear to have increased in urban environments from 40.4 to 64.55 and in rural ones from 17.85 to 30.60. The total number of deaths of all ages declared as due to tuberculosis appears to have diminished in urban environments from 17.85 to 8.63; rural deaths decreased from 14.34 to 8.14.

Tuberculosis has decreased proportionally less in the country than in towns; the decrease was especially noted in the pulmonary forms. In the country, the general mortality appears to be higher than in towns in relation to corresponding morbidity. In a report to the National Commission on BCG Dr. Cuvier drew the attention to the importance of bovine orgin in a large number of cases, particularly in nonpulmonary forms, especially osseous and meningeal infections, in infants. He advocated that the use of raw milk be prohibited.

Congress on Military Medicine.—The 13th congress on International Military Medicine and Pharmacy will take place in Paris June 17-23, 1951, under the presidency of Surgeon General Jame, director of the army medical service.

BELGIUM

Medicine in the Belgian Congo.—After his trip to the Belgian Congo, Dr. L. Mayer presented to the Association of the Belgian Medical Press a report on the present state of medicine in the colony. He made a detailed analysis of the status of the doctor and his family. The initial yearly salary of a doctor working for the government amounts to approximately 200,000 Belgian francs, after deduction of all taxes. Lodging conditions are satisfactory, and elementary or secondary schools are available almost everywhere. There are other material advantages, including allowances for room and board in the colony for the doctor and his family and pensions.

The scientific attractions include completely modern installations, and medical assistants and hospital attendants comparable to the best nurses. The training of sanitary personnel is extensive. The official teaching, especially developed in Leo-

The items in these letters are contributed by regular correspondents in the various foreign countries.

poldville, Usumbura and Stanleyville, includes a school for medical assistants, a school for hospital attendants (mainly for hygiene services) and a school for midwife-aids. The school for native medical assistants includes a section for medical assistants proper (four years of theoretical studies and two years as interns) a section for nurses (three years of theory, two years as interns) and a section for midwife-aids (two years of theory and practice). Dr. Mayer believes that 400 more doctors will soon be necessary in the Congo.

Judet's Operation.—Dr. Verbrugge, of Antwerp, recently reported on about 30 cases in which the head of the femur was replaced by a prosthesis in acrylic substance. Indications for use are arthritis deformans, pseudarthrosis with osteolysis of the neck, congenital dislocation in the adult and pseudarthrosis of the femoral neck. The simplicity and efficiency of the operation permit its use in luxation, subluxation and disturbances of growth.

In arthritis deformans, previous methods gave only partial relief and required long postoperative treatment. Judet's operation, performed with Hueter's incision, does not entail any muscular loss; it allows the patient to get up after two or three weeks and to be ambulatory after four or five weeks; it does not require any complicated postoperative treatment.

Pseudarthrosis of the femoral neck involves severe infirmity owing to shortening, lack of support and pain; it is sometimes associated with aseptic necrosis of the femoral head. Judet's operation must often be completed by osteotomy of the greater trochanter.

For fracture of the femoral neck (the "unsolved fracture" of the Anglo-Saxons), all previously used methods entail a high percentage of complications. Judet's technique allows the patient to return to his occupation within three months. Other indications include traumatic subluxation, congenital dislocation and epiphysiolysis.

Scientific Research in the Belgian Congo.—Prof. P. Staner recently held a conference at the University Foundation of Brussels, stressing the importance of scientific research as a factor of the economy of the Congo. The author traced the history of the important researches undertaken since the time of Leopold II: The number of research laboratories increased since 1933. For example, the production of oil varied between 800 and 1,000 kg. per hectare in the palm-tree plantations in 1934 and was 2,000 kg. per hectare in 1950. Culture of cotton gives the natives resources that amount to approximately 200 million Belgian francs a year. Extraction of quinine salts has been improved.

Saturnism in Pyrite Mines.—An inquiry carried by Dr. Genot in pyrite mines gave interesting results concerning the symptoms of lead intoxication. Ten to 12 per cent of the workmen showed a lead line on the gums, mainly where teeth were missing. Sensory disturbances are mainly localized along the course of the nerves. They occur in 44 per cent of the workmen after 15 years of service, especially in men working at the bottom of the mine and in 45 year old miners. These figures are considerably higher than the average observed in other industries. These symptoms are usually very mild; Dr. Genot did not find any severe lead intoxication in the pyrite mines he visited.

Goiter in East Belgium.—Professor Brull published a study on the incidence of thyroid disturbances in East Belgium, based on more than 4,000 examinations. He concluded that there was an 8.5% incidence of thyroid hypertrophy in adults. Of 303 female student nurses, 17.2% had goiter; of 876 male students between the ages of 18 and 25, 14.1% had goiter. These figures show that half the patients with pubertal goiter recover.

Among 1,338 goiters diagnosed before 20 years of age, 213 had been noticed by the patient's family before 10 years of age. They were always colloid goiters. Thus, at least 40% of the goiters were present before the patient reached the age of 20. It is difficult to decide whether one must give iodine in case of pubertal goiter. Some patients are greatly benefited by this, while in others the effectiveness of iodine is temporary or doubtful.

Hereditary influence can be traced in 1,337 out of 4,134 cases; 82.1% of goiters were observed in women and 17.9% in men. Among 4,134 cases, Brull observed 1,819 goiters with toxic manifestations, very obvious in 964 cases and mild in 854. The author observed a striking incidence of cardiac disturbances in persons with goiters classified as nontoxic. The incidence is low in young people and increases in older age groups. Among 526 patients above 40 years of age with nontoxic goiters, 58.5% had cardiac disturbances.

COLOMBIA

Request Changes in Medical Practice Act.—Prof. José del Carmen Acosta, president of the Colombian medical federation, addressed an open letter to the president of Colombia, which appeared in *Heraldo Médico* (January-February, 1951). The medical body requested from the government changes in the organization and functioning of the Colombian Institute of Social Welfare as well as in the law on medical practice in relation to medical services in rural public health and rural hygiene (*J. A. M. A.* **142:**835 [March 18] 1950). The consensus of the medical profession is that all physicians who finished their medical studies should be given their M.D. degree immediately after they finish their medical studies and not after a year of rural service. Change is also requested in the law by which foreign physicians, graduates of universities whose diplomas are not recognized in Colombia, are allowed to practice medicine if they apply to the ministry of hygiene for an appointment for rural service for three years. The members of the medical federation believe this is unnecessary, since, for lack of economical and other means, the rural health program will not be immediately realized and since the number of physicians who finish their studies in the Colombian medical faculties every year is sufficient to fulfill the actual and future needs of medical care of the rural population. In this manner all rural territories, small towns and municipalities will have Colombian graduate physicians without the need of importing foreign physicians. The medical body collaborated with the Colombian Institute of Social Welfare, but the medical body has pointed out the dangers of extension of total insurance. Social insurance should protect the centers that are in economic need but not those which are not in need. Large industrial centers in which adequate medical services for the workers has been already established should not be included in social insurance. The members of the federation believe that the physicians should work in the Institute of Social Insurance on a fee basis and not on salaries.

Personals.—Drs. L. Fortier and P. B. Salatich of New Orleans; A. Antweil of Fort Worth, Texas; W. Gildorf, of Valley City, N. D.; M. Sonderegger, of Ely, Nev.; J. Gordon, of Lewisburg, Tenn.; W. Fountain, of Merced, Calif.; W. Terrel Simpson, of Winter Haven, Fla.; J. Fancher, of Atlanta, Ga., and E. Keith Chunn, of Houston, Texas, arrived in Medellín on March 13. The physicians were invited to Colombia in the course of their visit to clinics and hospitals in Panama and in Latin-American countries. Several festivities were held in their honor. On March 15 they visited clinics and hospitals in Cali. After that they left Colombia for Ecuador and Peru.

MEXICO

New Additions to the Instituto Nacional de Cardiologia.—As the Instituto Nacional de Cardiología enters its eighth year, important additions have been undertaken, which will transform its physical plant, increase its capacity and enhance the efficiency of the work—clinical as well as research—of the institution. The space devoted to laboratories will be doubled, and a special service of cardiovascular surgery will be created, including the necessary amphitheaters; a new hospital section will contain only single rooms. A new building will be devoted to class rooms and laboratories for the school of nursing, adequate accommodations for guest physicians and lecturers and new intern's quarters.

CORRESPONDENCE

MEDICAL MYCOLOGY IN GREAT BRITAIN

To the Editor:—In a recent visit to the Medical Mycology Laboratory at the London School of Hygiene and Tropical Medicine in Great Britain, I had an opportunity to become acquainted with the problems of the medical mycologist in that country and learned of the progress which the British have made in this important field of medicine. I believe that a report on medical mycology in Great Britain would be of interest to physicians and medical mycologists in this country.

In Britain, public health laboratory workers are being called on more frequently to assist in the diagnosis of mycotic diseases than ever before. To meet this need, this world-famous laboratory of medical mycology has recently expanded its facilities for reference diagnosis and for the teaching of diagnostic methods. The department of medical mycology combines three functions: teaching, mycological reference work and the maintenance of a collection of pathogenic fungi. About 4,000 specimens are examined a year, and skin-testing agents are distributed.

In a recent work "Survey of Fungus Diseases in Britain," Dr. Roland Riddell, senior lecturer in medical mycology at the University of London, indicates that a wide variety and a considerable number of mycotic infections are being seen and recognized in Britain. As in other countries, the ringworm infections comprise the bulk of the fungus diseases. The vast majority of hair infections are of the small-spored, ectothrix type due to Microsporum species, where diagnosis is assisted by the bright yellow-green fluorescence seen under Wood's lamp. Ringworm of the anthropophilic species, Microsporum audouini, first appeared as an epidemic problem in England during World War I. The incidence decreased after this period, and in some areas the infection had almost disappeared by 1939 (Kinnear, J., and Rogers J.: *Brit. M. J.* **2**:854, 1948). Its recrudescence in recent years, as in the United States, may be explained by war conditions, mass movements of children in evacuation schemes and consequent relaxation of supervision by parents and school medical staffs, which allowed the endemic condition to become epidemic. In some areas of England, particularly the southern counties, the number of scalp ringworm cases has not increased as in the midlands and the north, and infections due to M. canis, the common type of ringworm contracted from cats and dogs, are about equal in number to M. audouini infections (Walker, J.: *Brit. J. Dermat. & Syph.* **62**:239, 1950). As in the United States, M. gypseum infections, also contracted from cats and dogs, are rare.

Other causes of ringworm of the scalp in Britain are Trichophyton mentagrophytes, T. faviforme, T. tonsurans and T. schoenleini. The Trichophyton species, which only rarely cause tinea capitis, are frequently missed in Wood's light surveys, as they produce a nonfluorescent type of infection. T. mentagrophytes is most frequently contracted from animals. The lesions are usually of a suppurative type and may heal spontaneously. T. faviforme is the common cause of cattle ringworm in Britain; it is especially prone to produce intractable kerionic lesions and to cause sporadic diseases of both children and adults in contact with farm animals. The endothrix species, T. tonsurans, and its varieties, particularly var. sulfureum, has been frequently isolated in Britain. The chronic nature of infections due to this organism makes its treatment a difficult problem. T. schoenleini, the causative agent of the disease favus, occurs not uncommonly in urban areas where families are living in overcrowded conditions.

Tinea pedis is prevalent among servicemen and is an important cause of invalidism among the miners of Britain. T. mentagrophytes is most commonly isolated, and Epidermophyton floccosum and T. rubrum more rarely.

T. rubrum is the commonest cause of nail infections producing intractable and destructive lesions. Groin infections are almost always caused by E. floccosum. Ringworm of other areas of the glabrous skin are due chiefly to the animal-infecting species: M. canis, T. faviforme and T. mentagrophytes.

With regard to the subcutaneous mycoses, actinomycosis is as common as in other parts of the world. The anaerobic actinomycete Actinomyces bovis, or A. israeli as many British workers designate the human pathogen, is frequently isolated from tonsillar crypts, and most strains received at the Reference Laboratory have been associated with jaw injuries. Dr. Riddell mentions two recent isolates recovered from granulomas of the lachrymal ducts. Sporotrichosis is apparently a very rare disease in Britain.

Of the systemic mycotic diseases, blastomycosis caused by Blastomyces dermatitidis has been reported only once (Dowling, G. B., and Elsworthy, R. R.: *Proc. Roy. Soc. Med.* **19**: Sect. Dermat. 4-10, 1925-1926), and this occurred in a man who had been handling wood from the United States. Coccidioidomycosis, which is so prevalent in certain areas of Southwestern United States, is unknown in England except as a laboratory infection. Histoplasmosis with widespread reticuloendothelial involvement has not been reported as having been contracted in England. One case, however, in which only skin lesions were presented, was reported by Duncan (*Tr. Roy. Soc. Trop. Med. & Hyg.* **40**:364,1947). It is interesting that in this case the organisms found in the tissue were unusually large. Histoplasmin skin-testing surveys have to date given negative results; an extensive survey has recently been instituted in conjunction with the Research Committee of the British Tuberculosis Association.

Cryptococcosis occurs in Britain as an unusual sporadic disease as elsewhere in the world. It most commonly causes a meningitis and is more frequently being considered in differential diagnosis.

A valuable contribution in the field of taxonomy in medical mycology, "Nomenclature of Fungi Pathogenic to Man and Animals," has recently been published by the British Medical Research Council (Medical Research Council Memorandum 23, His Majesty's Stationery Office, London, 1949).

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SODIUM ADSORBENT RESINS—WARNING

To the Editor:—With the recent release of sodium adsorbent resins by the Food and Drug Administration, I anticipated that serious difficulties would arise, since the dangers associated with resin administration are not generally known.

During the past two years, I have investigated the use of these resins in patients with kidney disease. Most emphasis in the literature, and in the information supplied by the pharmaceutical manufacturers, is placed on the danger of potassium depletion. Equally dangerous is the rapid development of acidosis in the patient whose renal function and base conservation are insufficient to compensate for the release of acid ions. The latter danger is especially pronounced in patients with diabetes mellitus and renal insufficiency. A few days of resin administration, in such patients, may produce profound hypokalemia and acidosis, which may prove fatal. This disaster may occur even with the resins that are partially in the potassium cycle.

Since public release of the resin, it has been my unfortunate experience to see in consultation one such patient who died; it is therefore urgent that the profession be warned concerning this particularly dangerous situation.

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BRUCELLOSIS

To the Editor:—In the April 14, 1951 issue of THE JOURNAL I note a very interesting editorial on "The Problem of Brucellosis." In the article it is stated that "since brucellosis is not generally transmitted from person to person, the prevention of human infection is dependent on the control and elimination of the disease in animals." The rest of the article deals primarily with this method of control and discusses the treatment of the disease. However, I can find nothing concerning the most important method of control at our disposal, which is, of course, pasteurization of all milk supplies. Naturally, I do not maintain that this is the only method of control of brucellosis that should be used, but I do think that it should always be considered in conjunction with all the other methods of control that are described in the editorial mentioned above.

In addition, I might say that, in discussing methods that may be used to control the spread of brucellosis, one should be careful to differentiate between measures designed to control bovine brucellosis in cows, bovine brucellosis in humans and porcine brucellosis in pigs. The remarks I have made concerning pasteurization of milk apply, of course, only to bovine brucellosis in humans.

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PENICILLIN TREATMENT OF SYPHILIS

To the Editor:—In THE JOURNAL of April 21, 1951 (page 1223) there appeared an article on penicillin treatment of syphilis, recommending specific treatment schedules for the various stages of syphilis. For neurosyphilis, a total dosage of 6 million units of penicillin is advocated as minimal adequate treatment. This amount may be sufficient in most patients with meningovascular syphilis. In dementia paralytica, 6 million units is an entirely inadequate dosage.

In the early days of penicillin therapy, mainly as the result of underdosing up to 5 million units, the treatment of general paralysis with the antibiotics did not give the same results as malaria therapy. Through clinicoanatomic studies, it soon became apparent that with an increasing total amount the effectiveness of the antibiotic usually (but not always) augmented, and the amount of 10 million units of penicillin was found to be about equivalent to a course of malaria fever (*Dis. Nerv. System* **10**:368 [Dec.] 1949). The occasional persistence of a few spirochetes in the brain following this amount, however, suggested that even a higher initial total dosage, possibly in the neighborhood of 15 million, may be required for maximal results.

As to the treatment of cardiovascular syphilis, the same amount, 6 million units, has been recommended. However, recent histologic studies have revealed that the inflammatory foci of the syphilitic aorta are even more refractory to therapy than are the inflammatory lesions of the general paralytic brain. Judging from the extreme resistance of the syphilitic exudate in the wall of the aorta, even a larger total dosage than the one advocated for dementia paralytica may be needed for the successful therapy of syphilitic cardiovascular disease.

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CORTISONE AND LARYNGEAL EDEMA

TO THE EDITOR:—Cortisone and pituitary adrenocorticotropic hormone (ACTH) have been shown to inhibit a wide variety of tissue reactions. An important application of this action on laryngeal edema due to a variety of causes is indicated in the following brief account. A detailed study of the cases mentioned below and others will be submitted at a later date.

At first, an attempt was made to evaluate the action of cortisone on laryngeal edema secondary to a course of protracted fractional irradiation for carcinoma of the larynx. The result was most striking in that within 11 hours the edema had noticeably diminished and within four days the edema was minimal. No antibiotic or chemotherapeutic agents had been given. A second patient with laryngeal edema of similar pathogenesis was so treated. The results were equally impressive.

Four patients with subglottic edema (croup), ranging from moderately severe to severe, were given cortisone. In two, indirect laryngoscopy could be performed without difficulty. The subglottic swelling diminished markedly in both patients within 12 to 24 hours. The two other patients were not followed laryngoscopically, but the clinical improvement within 12 hours was notable in each. All four patients received antibiotics and steam before and during the administration of cortisone.

A patient with supraglottic edema due to a hypopharyngeal abscess secondary to a foreign body was given cortisone. Within 12 hours, inspection of the larynx revealed marked diminution of the edema. Antibiotics had been given for 36 hours previously without effect.

Hospitalization was necessary for all the patients mentioned, because of impending asphyxia. Cortisone was administered in all cases but one by mouth and in full doses. Toxic effects due to fluid retention was observed in one case after prolonged administration of cortisone. This was satisfactorily controlled by diuretics.

The obvious importance of cortisone and, possibly, pituitary adrenocorticotropic hormone in the management of laryngeal edema as exhibited in the small number of cases mentioned above has prompted this early and urgent report.

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PREPARATION OF AN ULTRAFILTRABLE ACTH, EFFECTIVE IN SMALL DOSES

To the Editor:—An ultrafiltrable preparation of adrenocorticotropic hormone, effective clinically in daily doses of only 3.5 to 7 mg., has been prepared. This preparation has been used successfully in total doses not exceeding 60 to 80 mg. in the treatment of rheumatoid arthritis, purpura annularis telangiectodes (Majocchi's disease), lupus erythematosus and certain ophthalmologic conditions. No toxic manifestations have as yet been noted. A dose of 3 mg. induces a fall in eosinophils in persons with normal adrenal functions, according to Thorn's technique. The preparation is obtained by ultrafiltration of an aqueous solution of anterior pituitary powder buffered at pH 5.2. It is slightly yellow and thermostable and contains about 2.5 mg. of solid substance per milliliter. The nitrogen content is about 5 per cent of the organic substance. Amino acid analysis by paper chromatography reveals a limited number of amino acids, including aspartic acid, glutamic acid, tyrosine, glycine and alanine. These data are similar to those reported for an active ultrafiltrate obtained by Cortis-Jones and co-workers (*Biochem. J.* **46**:173, 1950) with the exception of nitrogen, which, in our preparation, is present in lower quantities. In this respect, it approaches the preparation of Geshwind and co-workers (*Science* **111**:625 [June 9] 1950), which, however, was obtained from pure hormone.

The biologic activity of our preparation has been demonstrated with hypophysectomized rats and by the ascorbic acid depletion test of Sayers and co-workers (*Endocrinology* **42**:379, 1948). Active preparations with a simple polypeptide structure have also been reported by C. H. Li (Conference on Metabolic Aspects of Convalescence, 1948 Transactions of the Seventeenth Meeting, New York, Josiah Macy Jr. Foundation 1949, p. 114) and by Brink and co-workers (*J. Am. Chem. Soc.* **72**:1040, 1950).

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BUREAU OF LEGAL MEDICINE AND LEGISLATION

MEDICOLEGAL ABSTRACTS

Medical Practice Acts: Right of Mechanotherapist to Prescribe and Administer Drugs.—The defendant, a mechanotherapist, was charged by the state medical board with using certain drugs in violation of the rules and regulations governing limited practitioners. After a hearing before a referee, the state medical board entered an order revoking the defendant's license to practice mechanotherapy. From such order the defendant appealed to the court of common pleas of Ohio, Summit County.

At the hearing before the referee an inspector for the medical board testified that he visited the defendant's office and saw bottles labeled thiamine chloride, liver extract, nupercainal, quinocaine, metycaine and otozole and a jar labeled sulphathiozole ointment. He said the defendant admitted having administered all of these preparations, some for treatment purposes and some as local anesthetics. When the inspector asked the defendant if he would discontinue the use of these remedies in his limited practice, the defendant just shrugged his shoulders.

The power to revoke a limited practitioner's license is governed by Section 1274-6 of the Ohio general code which provides in part: ". . . the board . . . may also revoke or suspend the certificate of anyone to whom a limited certificate has been issued upon proof of the violation of the rules and regulations established by the board governing such limited practice." Part of the general rules and regulations of the board governing limited practitioners is the following: "The certificate does not permit the holder to treat infectious, contagious, or venereal diseases nor to prescribe or administer drugs or to perform major surgery." The statutes (Section 1274-3) also provides, in relation to limited licenses: "Such certificate shall authorize the holder hereof to practice such limited branch or branches of medicine or surgery as may be specified therein, but shall not permit him to practice any other branch or branches of medicine or surgery nor shall it permit him to treat infectious, contagious or venereal diseases, nor to prescribe or administer drugs, or to perform major surgery."

The first principal question raised by the court was whether or not the pertinent rules and regulations of the state medical board were invalid, ultra vires or unconstitutional. The right to practice limited or unlimited branches of medicine or surgery is not an inherent or God given right, nor is it a right that once obtained is perpetual, said the court. It is a right given to someone who, because of his training, education and experience, has been found to have the qualifications to perform in his respective field, subject, however, to the laws, rules and regulations governing that right. When one is given a license to practice in a limited branch of medicine or surgery, that one impliedly agrees to conform to and abide by the laws, rules and regulations prescribed for his particular branch of medicine or surgery, the nonperformance of which will result in disciplinary measures such as suspension or revocation of license. Counsel for the defendant contended that Section 1274-1 of the Ohio General Code, authorizing the medical board to establish rules and regulations governing such limited practice, should rightly be construed to mean that the board shall have the right to establish rules and regulations only for the administration, and not for the enlarging or restricting, of the statutory laws. Did the board in this instance enlarge or restrict the statutory laws? It is to be noted, said the court, that the last paragraph of Section 1274-3 and the rules and regulations of the state medical board are practically the same. They both set out a prohibition whereby limited practitioners cannot use drugs or practice major surgery. The right given by the legislature thus canalized the board's discretion rather than leaving it unconfined. It was a proper grant under the exercise of police powers, therefore, the court concluded, the rules and regulations pertaining to the instant case are valid and not ultra vires.

The next question was whether or not the rules and the statute are invalid for indefiniteness, uncertainty and ambiguity. The defendant claims that since the term "drug" is not defined in the statute or in the rules and regulations the term then becomes vague, indefinite, uncertain and ambiguous. The term "drug" said the court, is defined under the pharmacy laws of this state. Section 1296-1, paragraph 2, is as follows: "The term 'drug' or 'pharmaceutical preparation' means (a) articles recognized in the official United States Pharmacopoeia, or official National Formulary, or any supplement to either of them, intended for use in the diagnosis, cure, mitigation, treatment or prevention of disease in man or other animals; and (b) all other articles intended for use in the diagnosis, cure, mitigation, treatment or prevention of disease in man or other animals; and (c) articles, (other than food) intended to effect the structure or any function of the body of man or other animals; and (d) articles intended for use as a component or any articles specified in clause (a), (b), or (c); but does not include devices or their components, parts or accessories." It cannot have a different and varying definition under the heading of pharmacy laws than it would have under the medical board laws. One works in conjunction with the other, as the druggist supplies the doctor, and the definition of the term "drug" should be compatible one with the other. Therefore, although the medical practice act and the rules and regulations of the state medical board do not define "drugs", the court does have the right to accept, and should recognize, the definition of that term under the pharmacy laws. The court therefore held that Section 1274-1 and 1274-3 are not invalid for indefiniteness, uncertainty or ambiguity.

Finally, the court discussed the question of whether or not the defendant, a duly licensed mechanotherapist, could use sulphathiozole ointment, metycaine, nupercainal, quinocaine or otozole in the performance of minor surgery or could prescribe or administer vitamin or liver extract. The defendant did not deny the fact that he told the inspector for the medical board that he had administered or prescribed all of these items to his patients and therefore the referee and the board had the right to accept the testimony of the inspector as the truth. Were these remedies or materials "drugs"? Dr. Sollman, who testified on behalf of the medical board, stated unequivocally that sulphathiozole ointment, metycaine, liver extract and thiamine chloride were drugs. His testimony was not rebutted. At first blush to say that a limited practitioner of medicine or surgery should not be allowed to prescribe or administer vitamins or liver extract for a physical deficiency seems rather farcical, for immediately one realizes that these items can be purchased generally without prescription. Upon meditation, however, said the court, one must necessarily conclude that this prohibition is not an absurdity, for someone in whom you place your future health and in whom you put your trust should be a person who is qualified to speak, to comprehend the nature of your deficiency and to know the necessary prescription therefor. Since defendant is a limited practitioner it is presumed that he is not qualified or versed in the use of vitamins or liver extract, even though he may well be. However, the line must be drawn somewhere, and the legislature has seen fit, from the standpoint of public safety, to say by legislation that practitioners of mechanotherapy shall not administer or prescribe drugs, regardless of their knowledge. Since the court concludes that vitamins and liver extract are drugs, such then cannot be prescribed or admintered by limited practitioners. The defendant suggested, however, that since his practice was limited only by the prohibition not to prescribe or administer drugs or perform major surgery he could, therefore, perform operations for all minor surgery. To perform various types of minor surgery it was testified that local anesthetics and antiseptics were a necessary adjunct to successful operations, and therefore defendant contended that, since he is entitled by implication to perform minor surgery and a necessary adjunct to such cases of minor surgery is local anesthetics and local antiseptics, he therefore is permitted to use them in his limited practice. The defendant is a mechanotherapist and mechanotherapy is defined as being the use of manual, physical or mechanical measures for the treatment of disease, but such physical or mechanical measures shall not in-

clude the use of x-ray or radium for therapeutic purposes. It impresses the court that the mechanotherapist is allowed to practice minor surgery, but it must be such as is accomplished by massage or other similar means, either manually or mechanically. Legislative enactments must be so construed as not to present an absurdity. Can a court conscientiously say that although the legislature has prohibited limited practitioners from prescribing or administering drugs but granted the right to practice some minor surgery, therefore the legislature did not mean what it said and that drugs can be used, since in some instances they are considered a necessary adjunct to minor surgery? This court believes that such a pronouncement would be unconscionable and erroneous, and it would be establishing a right by implication in the face of expressed legislative restriction and prohibition.

Accordingly the court concluded that a licensed mechanotherapist must not prescribe or administer drugs of any kind in performing minor surgery; that the minor surgery which he is permitted to perform must be an operation within the limits of mechanotherapy; and that vitamins and liver extract, as well as sulphathiazole ointment and metycaine, are drugs within the meaning of the statutes of Ohio. Accordingly the order of the state medical board revoking the license of the defendant to practice mechanotherapy was affirmed.—*Botkin v. State Medical Board, 96 N.E. (2nd) 215 (Ohio, 1950).*

Compensation of Physicians: Infant's Liability for Costs of Medical Services.—The plaintiff, a minor, received injuries due to the alleged negligence of the defendant. Subsequently the plaintiff's mother, as guardian ad litem, commenced an action on the infant's behalf against the defendant for injuries to the plaintiff and for medical and hospital expenses incurred. The defendant filed a motion to strike that portion of the plaintiff's complaint asking damages for medical and hospital expenses. The case was heard in the supreme court, Chenango County, New York.

The plaintiff contended that such items constitute necessaries furnished the infant for which the infant is now, or may in the future, be obligated because his mother, who works for a small daily wage, is without financial means to meet them. The defendant, however, contended that parents are liable for the expenses of hospitalization, medical, surgical, nursing care and attendance of an infant and that therefore such items form no part of the infant's cause of action and any reference thereto should be stricken from the complaint.

Under the common law, said the court, an injury to an infant due to the negligence of an alleged wrongdoer, gives rise to two causes of action. The parents upon whom rests the responsibility of supporting and maintaining the infant, have a cause of action for the loss of the infant's services, hospital, medical expenses, etc. and a cause of action accrues to the infant for damages as a result of the injuries sustained. If the parent is, or will be, of financial ability to pay such expenses, the primary responsibility rests upon him and not the infant. In fact, the infant cannot, under these circumstances, legally bind himself to pay. In such a situation, the cause of action for such expenses belongs exclusively to the parent, as he is the party who has been actually damaged in that respect. However, the court continued, an infant may become liable under certain circumstances for necessaries furnished him under an implied contract to pay therefor. The theory upon which the infant is rendered liable for necessaries is that they have been furnished and were necessary and that the person standing in the relation of parent had not the ability to respond for the amount. Medicines and medical attendance furnished to an infant when his health or physical condition require them ordinarily constitute necessaries for which he may render himself liable. This liability attaches where it appears that the parent is unable to, or at least does not, provide for the infant. In this case it is alleged, and not disputed, that the parent is financially incapable of making payment for these expenses. Under such circumstances, said the court, the infant plaintiff may be sued and held legally responsible therefor. It would be manifest injustice, the court continued, to allow an alleged wrongdoer under the circumstances here presented to escape responsibility for payment of a substantial part of the pecuniary consequences which flowed naturally and proximately from his alleged negligent acts. Accordingly the defendant's motion to strike the portion of the plaintiff's complaint relating to hospital, medical, and surgical services rendered to the infant was denied.—*Natoli v. Board of Education of City of Norwich, 101 N.Y.S. (2d) 128 (New York 1950).*

MEDICAL MOTION PICTURES

Hepaticojejunostomy Following Common Duct Injury: 16 mm., color, silent, showing time 26 minutes. Produced in 1951 by and procurable on loan or purchase from Philip Thorek, M.D., 25 East Washington St., Chicago 2.

This motion picture shows the surgical technic for an anastomosis between the proximal jejunum and the common hepatic duct. The indication for the surgical procedure in this case was obstruction of the common duct caused by injury at a previous cholecystectomy. The case history of the patient is presented. She is severely jaundiced and debilitated. Adequate preoperative preparation, because of the severe nutritional disturbances seen in many of these patients, is stressed.

The abdomen is opened through a right upper paramedian incision. Many adhesions are encountered, which makes exposure of the portahepatis difficult. After lysis of the adhesions, mobilization of the duodenum and hepatic flexure of the colon, a bulbous common hepatic duct is well exposed and demonstrated. The anatomy encountered in this region and the relation between the various structures are well shown and then amplified by means of a colored, animated illustration.

A statement is made that the intrapancreatic portion of the common duct could not be found. The technic of attempting to find it is not demonstrated. The tip of the bulbous common hepatic duct is freed of scar tissue. After accurate identification of the bulbous common hepatic duct by means of a needle aspiration of bile, the duct is opened. A loop of jejunum is brought up through the transverse mesocolon and an end to side anastomosis made between the bulbous common hepatic duct and the jejunum. The anastomosis is performed with two rows of interrupted, nonabsorbable suture. Before completing the inner row of the anterior portion of the anastomosis, the operator inserts a "T" tube into the common hepatic duct and into the jejunum. The anterior portion of the anastomosis is then completed around the long arm of the "T" tube. A colored illustration is presented to show the technic of the anastomosis. A drain is placed in the right kidney fossa and brought out through the wound along with the "T" tube.

Following operation, the patient's nutritional state improved remarkably and her icterus index, which was extremely high before surgery, dropped to almost normal after three months. The "T" tube was removed at about three months. A cholangiogram is presented which was done just prior to removal of the "T" tube, but the intrahepatic ducts are not too well demonstrated.

Almost invariably the intrapancreatic portion of the common duct can be found. If it cannot be isolated via dissection in the region of the head of the pancreas, the duodenum can be opened and a probe passed in retrograde fashion through the ampulla of Vater. By such means, the distal portion of the common duct can almost always be found. Since a good sized segment of the common hepatic duct was spared, it would have been a much better procedure to have isolated the distal common duct and to have performed a primary end to end anastomosis over a "T" tube between the isolated bulbous common duct and the distal intrapancreatic portion of the common duct.

The film might be used to supplement a lecture on repair of injuries to the common duct. Throughout most of the picture, the surgical field is not centered; otherwise, the photography is good.

MEDICAL LITERATURE ABSTRACTS

AMERICAN

A. M. A. Arch. Ophthalmology, Chicago

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Ocular Manifestations of Diffuse Collagen Disease. M. L. Stillerman. —p. 239.
Physiological Considerations of ACTH and Cortisone Therapy with Reference to Ophthalmology. S. H. Armstrong Jr. and E. N. Irons. —p. 251.
Effect of Cortisone on Horse Serum Uveitis in Rabbits. A. C. Biegel. —p. 258.
Use of Adrenocorticotropic Hormone and Cortisone in Ocular Disease. J. A. Olson, E. H. Steffensen, R. W. Smith and others.—p. 274.
Adrenocorticotropic Hormone (ACTH) and Cortisone in Ophthalmology: Report of Cases. H. G. Scheie, G. S. Tyner, J. A. Buesseler and J. E. Alfano.—p. 301.
Local Use of Cortisone in Ophthalmic Diseases. H. A. Mosher.—p. 317.
Early Clinical Results of ACTH and Cortisone Treatment of Ocular Diseases. J. R. Fitzgerald, J. G. Bellows, J. M. Donegan and others. —p. 320.
Diseases of Uveal Tract. M. J. Hogan.—p. 334.

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*Effects of Water Load Administered to Patients During Immediate Postoperative Period: Hypotonic Syndrome. I. M. Ariel.—p. 303.
*Liver as Factor in Experimental Renal Hypertension. L. Davis and C. A. Tanturi.—p. 325.
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Traumatic Aneurysm as Complication of Supracondylar Fracture of Humerus. C. B. Davis Jr. and E. H. Fell.—p. 358.
Clinical Factors Affecting Mortality in Strangulated Hernia. H. Laufman and J. Daniels.—p. 365.
Nerve Anastomosis in Treatment of Facial Paralysis: Special Consideration of Etiologic Role of Total Removal of Tumors of Acoustic Nerve. J. G. Love and B. W. Cannon.—p. 379.
Dermatofibrosarcoma Protuberans: Report of 39 Cases. G. T. Pack and E. J. Tabah.—p. 391.
Endometriosis: Evidence of Tubal Origin in Distribution of Lesions. J. Fallon.—p. 412.
Effect of Adrenoxyl on Blood Loss from Surgical Wounds. R. F. Hagerty, J. J. Zavertnik and K. S. Grimson.—p. 420.
Cause and Treatment of Pruritus Ani. C. C. Tucker.—p. 428.
Volvulus of Sigmoid Colon. H. D. Hilton and J. M. Waugh.—p. 437.
Homologous Transplantation of Tissues: Review of Literature. W. P. Longmire Jr. and S. W. Smith.—p. 443.

Postoperative Water Metabolism.—The fate of intravenously administered water was studied in 20 patients immediately following a major surgical procedure. On the day of operation each patient received an average of 3,562 cc. of distilled water containing 5 per cent glucose. Eight patients regarded as showing normal urinary excretion retained 429 cc. of this fluid in the first 24 hours, while the remaining 12 patients retained an average of 1,768 cc. This retention was only transitory, however. After three days of approximately constant fluid intake the first group showed a cumulative water retention of only 87 cc., while the second group excreted an average of 246 cc. more fluid than was administered. In the group that retained fluid initially there was no increase in the average plasma volume but the extracellular fluid increased significantly. The hypochloremia that occurred postoperatively was attributed partly to chloride excretion in the urine, which was equal in the two groups, and partly to wider distribution of the chloride ion throughout the increased intercellular fluid. The intracellular edema that resulted from dilution of the intercellular electrolytes was held responsible for the convulsions that sometimes occur postoperatively. These are rendered more likely when brain cell permeability is increased because of brain damage, severe arteriosclerosis or anoxemia. The authors have previously demonstrated that postoperative retention of fluids is not due to changes in kidney function. It has been attributed to hormonal disturbances. Therapy consists of dehydration of the patient followed by the administration of saline solution.

Role of Liver in Hypertension.—Experiments in dogs have shown that the hypertension produced by the application of Goldblatt clamps to the renal arteries can be relieved if the blood flow to the liver is reduced in a similar manner. Reduction of the blood flow in the portal vein is more effective in lowering the systemic blood pressure than total occlusion of the arterial blood supply to the liver. The reduction in systemic blood pressure does not occur immediately, which suggests an indirect mechanism. Moreover, no hypotensive effect is obtained unless the blood supply to the liver is reduced sufficiently to produce fatty infiltration of the liver cells. This pathological change in the liver may or may not be detectable by liver function tests. These experiments confirm current theories that the liver is intimately involved in the regulation of the peripheral circulation.

American Heart Journal, St. Louis

41:161-322 (Feb.) 1951

Effect of Digitoxin on Apparent Stroke Volume, Posteroanterior Cardiac Diameter, and Cardiac Cycle in Normal Subjects as Studied by Electrokymograph. E. E. Addleman Jr., K. Willis, M. J. Greve and H. E. Heyer.—p. 161.
Atrial Flutter: II. Methods of Treatment. G. R. Herrmann and M. R. Hejtmancik.—p. 182.
Effects of Exercise on Circulatory Dynamics in Mitral Stenosis: III. R. Gorlin, C. G. Sawyer, F. W. Haynes and others.—p. 192.
*Disorders of Cardiovascular System Occurring with Catheterization of Right Side of Heart. W. T. Zimdhal.—p. 204.
Transient Right Bundle Branch Block Produced by Heart Catheterization in Man. E. Simonson.—p. 217.
Prognosis in Bundle Branch Block: II. Factors Influencing Survival Period in Left Bundle Branch Block. R. P. Johnson, A. L. Messer and P. D. White.—p. 225.
Id.: III. Comparison of Right and Left Bundle Branch Block with Note on Relative Incidence of Each. A. L. Messer, R. P. Johnson and P. D. White.—p. 239.
Ventricular Complex in Esophageal Electrocardiography. L. Scherlis, J. Wener, A. Grishman and A. A. Sandberg.—p. 246.
Factors Influencing T Wave of Electrocardiogram: III. Nonchronotropic T Changes Produced by Acetylcholine. I. M. Liebow and H. K. Hellerstein.—p. 266.
Critical Rates in Ventricular Conduction: III. Simulation of Ventricular Tachycardia. H. Vesell and L. B. Kraemer.—p. 280.
Coupled Extrasystoles and Automatic Ventricular Rhythms. D. Scherf and A. Schott.—p. 291.
*Cor Triloculare Biatriatum: Analysis of Clinical and Pathologic Features of Nine Cases. H. M. Rogers and J. E. Edwards.—p. 299.

Complications of Cardiac Catheterization.—Two cases are described in which arrhythmia could be attributed to right heart catheterization. Both concerned four year old children. In one, nodal tachycardia developed with the catheter in place. The arrhythmia did not cease spontaneously after 30 minutes and was terminated by treatment. In the other patient, with a tetralogy of Fallot, complete auriculoventricular heart block developed the day after the catheter had been removed. Second degree heart block then appeared, followed by first degree auriculoventricular heart block. The electrocardiogram returned to normal in seven days. The literature is reviewed, and results in other clinics are discussed. Local and intracardiac venous thromboses, pulmonary and cerebral emboli and cardiac arrhythmias have been observed. Fortunately, these complications are usually temporary and transient. Fatal complications have been en-

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Titles marked with an asterisk (*) are abstracted.

countered rather infrequently. Catheterization of the right side of the heart has proved to be a most valuable aid in the diagnosis of congenital heart disease and in the study of other heart and pulmonary diseases. It has a place in the hands of competent investigators, but successful application of this technique requires a trained team. Its use as a casual and infrequent procedure in inexperienced hands should be discouraged.

Cor Triloculare Biatrium.—Nine cases of cor triloculare biatrium, which represent all cases of this anomaly in the collection of pathologic specimens in the Mayo Clinic, are reviewed. In eight patients there was associated transposition of the great vessels. In six of these, the outflow tract of the common ventricle was so divided as to create a narrow tract leading to the aorta. The pulmonary trunk was wide. In two other patients, a subpulmonary fibrous collar created a moderate degree of subpulmonary stenosis. In the ninth patient the great vessels were not transposed. Coarctation of the aorta was associated with cor triloculare biatrium in two patients. In one of these, tubular hypoplasia of the aortic arch between the left common carotid and left subclavian arteries also was present. Six of the patients were male, and three were female. The age at death varied from 3 weeks to 8 years. Records of physical examination were available for seven patients, and each showed a precordial systolic murmur. At times, this was associated with a precordial thrill. Cyanosis varied in degree; in several instances it was mild and became intensified only before the patient's death.

American Journal of Clinical Pathology, Baltimore

21:101-200 (Feb.) 1951

Blood Media for Cultivation of Mycobacterium Tuberculosis. M. S. Tarshis and A. W. Frisch.—p. 101.
Bone Bank: Procurement, Preparation and Storage of Accessions. H. Gordon and B. Welsh.—p. 114.
Use of Perchloric Acid as Protein Precipitant in Determination of Acid-Soluble Phosphates and Nonprotein Nitrogen in Blood. S. P. Gottfried and G. L. Erdman.—p. 118.
Non-Lipoid Histiocytic Reticulosis with Meningioma Interrupting Pituitary Stalk. T. L. Linn.—p. 123.
Adjuncts to Mycologic Diagnosis. A. Raftery and F. W. Hartman. —p. 133.
Hemolytic Action of Ascorbic Acid at Low Temperatures. V. Traina. —p. 139.
Ascorbic Acid and Isoagglutination of Human Erythrocytes. V. Traina. —p. 141.
Alterations in Serum Potassium and Sodium in Acute Myocardial Infarction. S. K. Wilhelm.—p. 146.
Bone Marrow in Secondary Polycythemia Associated with Cor Pulmonale. K. Braun.—p. 149.
Histoplasmosis, Cryptococcosis and Tuberculosis Complicating Hodgkin's Disease: Report of Case. R. C. Rodger, L. L. Terry and C. H. Binford.—p. 153.
*Adrenal Cortical Failure Following Treatment with Cortisone and ACTH: Report of Case. E. L. Proctor and A. J. Rawson.—p. 158.

Cortisone, ACTH and Adrenal Cortex.—A woman aged 36 with lupus erythematosus disseminatus was treated with cortisone. On the first day 300 mg. was given, 200 mg. was given on the second day and 100 mg. daily thereafter for seven days. There was temporary improvement. Treatment was discontinued, but was resumed four days later with 100 mg., given daily for 13 days. Then treatment with pituitary adrenocorticotropic hormone (ACTH) was started. The initial dose was 25 mg.; next 12 mg. was given every six hours for three days, and then 30 mg. every six hours. Treatment was discontinued after seven days. Throughout this period the patient remained very ill, with spiking fever, despite the administration of penicillin and aureomycin. The patient's condition progressively deteriorated, and she died 11 days after pituitary adrenocorticotropic hormone was discontinued. The diagnosis of lupus erythematosus disseminatus was confirmed on necropsy. The lesions of the disease were relatively inconspicuous by comparison with the pronounced damage to the adrenal cortex. Cytolytic destruction of the adrenal cortex, with changes most pronounced in the fascicular zone, was attributed to the use of cortisone immediately followed by pituitary adrenocorticotropic hormone. The pronounced adrenal atrophy known to occur with the administration of cortisone doubtless produced an acute need for cortical steroids, particularly for those of the fascicular and reticular zones. The sudden stimulation of the adrenal cortex by pituitary adrenocorticotropic hormone could under these circumstances have produced a holocrine type of response resulting in cytolysis that was most pronounced in the fascicular zone.

American Journal of Physiology, Baltimore

164:301-572 (Feb.) 1951. **Partial Index**

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Disappearance of Isotopically Labeled Gold Colloids from Circulation of Dog. C. W. Sheppard, G. Jordan and P. F. Hahn.—p. 345.
Adjustments of Circulatory System Following Very Rapid Transfusion or Hemorrhage. A. C. Guyton, H. M. Batson and C. M. Smith.—p. 351.
Rutin and Other Flavonoids as Potentiators of Terminal Vascular Responses to Epinephrine and as Antagonists of Vasodepressor Materials. J. M. Crismon, R. R. Berez, J. D. Madden and F. A. Fuhrman. —p. 391.
Dynamic Aspects of Sodium Metabolism in Experimental Adrenal Insufficiency Using Radioactive Sodium. T. N. Stern, V. V. Cole, A. C. Bass and R. R. Overman.—p. 437.
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Colorimetric Determination of Serum Lipase Following Total Pancreatectomy in Dog. P. Glotzer and A. M. Seligman.—p. 486.
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Excitability Changes in Dorsal Roots Produced by Electrotonic Effects from Adjacent Afferent Activity. H. Grundfest and J. Magnes.—p. 502.
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Acute Intestinal Radiation Death: Studies on Roentgen Death in Mice, III. H. Quastler, E. F. Lanzl, M. E. Keller and J. W. Osborne.—p. 546.
Creation and Function of Total Stomach Pouch by Use of Gastro-Duodenal and Gastro-Antral Fistulas. W. H. Olson, L. Walker and H. Necheles.—p. 557.
Effect of Anoxia on Response of Isolated Intestine to Various Drugs and Enzyme Inhibitors. T. C. West, G. Hadden and A. Farah.—p. 565.

American Journal of Psychotherapy, New York

5:1-144 (Jan.) 1951. **Partial Index**

Public Education in Psychiatry: Is it Possible? Is it Desirable? C. Binger.—p. 4.
Experiment in Group Psychotherapy with Narcotic Addict. M. Johnston. —p. 24.
Factor of Omnipotence in Development of Paranoid Reactions. M. Hyroop.—p. 38.
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Am. J. Roentgenol. & Rad. Therapy, Springfield, Ill.

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Bronchography in Children. E. Rivero.—p. 173.
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Roentgenographic Study of Soft Tissue Pathology in and About Knee Joint. R. W. Lewis.—p. 200.
Multicentric Osteogenic Sarcoma in Paget's Disease with Cerebral Extension. H. Derman, P. Pizzolato and J. Ziskind.—p. 221.
Unusual Case of Carcinosarcoma of Esophagus. N. Ende, P. Pizzolato, L. Raider and J. Ziskind.—p. 227.
Description of Sr^{90} Beta-Ray Applicator and Its Use on Eye. H. L. Friedell, C. I. Thomas and J. S. Krohmer.—p. 232.
*Supraspinatus Tendinitis: Survey of 300 Consecutive Cases Treated by Roentgen Therapy. O. T. Steen and J. A. L. McCullough.—p. 245.
Practical Physical Aspects in Use of Radioactive Cobalt 60 as Radium Substitute. I. Meschan, R. R. Edwards and P. J. Rosenbaum.—p. 255.
Effect of Variation in Dosage Rate of Roentgen Rays on Survival in Young Birds. S. P. Stearner.—p. 265.
Effect of Over-All Time of Exposure upon Survival of Young Chicks Following Roentgen Irradiation. S. P. Stearner and E. J. B. Christian. —p. 272.

Supraspinatus Tendinitis Treated by Roentgen Therapy.—Supraspinatus tendinitis has been described under a multiplicity of terms, such as subacromial or subdeltoid bursitis, periarthritis or para-arthritis of the shoulder, peritendinitis calcarea, calcifying tendinitis or supraspinatus syndrome. The presenting symptoms are pain in the shoulder and limitation of movement. Roentgenographic examination reveals calcium deposits along the supraspinatus tendon and in the overlying bursa. It is believed that the role of trauma in the etiology of the condition has been overemphasized. The increasing incidence of the dis-

ease during the later decades of life is in keeping with the degenerative nature of the process. In 300 cases of supraspinatus tendinitis, roentgen therapy was employed. The initial course of roentgen therapy consists of four consecutive daily applications of 150 r (measured in air without back scatter) directed to the point of maximum tenderness through a 10 by 10 cm. port at 50 cm. target skin distance with a beam generated at 200 kv. and filtered through 0.5 mm. cu. plus 1 mm. aluminum. The acute signs and symptoms will frequently subside with a single course of treatment. If some symptoms persist in the more chronic type, a further course of treatment may be given. The patient should be told that some aggravation of symptoms may occur following the first treatment. He should also be cautioned against the use of counterirritants or other applications on the area treated, as intense skin reactions may result. In view of the degenerative condition of the tendon fibers underlying the inflammatory reaction, complete cure is rarely attained, but favorable results were obtained in 251 of the 300 cases (83.6 per cent). Of the 171 patients who answered a follow-up questionnaire, 151 (89 per cent) obtained favorable results. Patients who had received other types of treatment prior to roentgen therapy responded less favorably.

American Surgeon, Atlanta, Ga.

17:97-174 (Feb.) 1951

Duodenocolic Fistula from Advanced Carcinoma of Transverse Colon. Massive Palliative Resection. F. E. Kredel.—p. 99.

Perforated Carcinoma of Stomach. H. W. Mayo Jr. and R. W. Postlethwait.—p. 103.

Benign Stricture of Esophagus with Esophagobronchial Fistula Treated by Exclusion Procedure. R. W. Postlethwait, R. W. Hanckel and M. Weinberg.—p. 112.

Determination of Tensile Strength of Wounds in Vivo: Preliminary Report. R. W. Postlethwait, H. H. Bradshaw and R. W. Williams. —p. 118.

Intravenous Evipal Sodium-Decamethonium Bromide to Facilitate Endotracheal Intubation: Clinical Study. J. M. Brown and E. Ferrara. —p. 123.

Rapid Antibiotic Sensitivity Tests on Aerobic Organisms Associated with Chronic Ulcers. R. G. Harris and J. Y. White.—p. 127.

Hemorrhoid Therapy with Minimal Discomfort. D. L. Maguire Jr. —p. 132.

Appendico-Cecostomy in Treatment of Advanced Appendicitis. W. H. Prioleau.—p. 139.

Aureomycin Treatment of Rectal Strictures. L. Banov Jr.—p. 143.

Indications for Various Methods of Prostatectomy. K. M. Lynch Jr. —p. 150.

*Early Diagnosis of Carcinoma of Lung. E. F. Parker.—p. 156.

Diagnosis of Carcinoma of Lung.—There is nothing characteristic about the symptoms of carcinoma of the lung. The most common symptoms are cough, hemoptysis, fatigue, shortness of breath, a sensation of inability to get a deep breath, wheezing in the chest, pain in the chest and fever. Suspicion of carcinoma is justified when an unexplained cough persists for six weeks or longer in a person who has reached the cancer age. In addition to the history and physical examination, the following methods are helpful in the diagnosis of carcinoma of the lung: fluoroscopy of the chest, x-rays of the chest in two or more planes, bronchoscopy, examination of the sputum for tumor cells, examination of bronchial aspirations for tumor cells, bronchography, biopsy of lymph nodes to which it has spread, examination of pleural fluid for tumor cells, biopsy of the pleura without exploratory thoracotomy, biopsy of the lung, exploratory thoracotomy and autopsy. These methods are evaluated, and pertinent case reports are presented. Parker feels that it cannot be emphasized too strongly that exploratory operation must come into increasing use as a method of diagnosis in those patients with pulmonary disease in whom the presence of carcinoma cannot be excluded and in whom no other disease can be proven to account for the clinical picture. In 18 exploratory operations nine patients (50 per cent) were found to have carcinoma. In the remaining nine cases, there were found aortic aneurysm in three, tuberculosis of the pleura and lung in two and organizing pneumonia, lung abscess, actinomycosis and intrathoracic goiter in one case each. In the cases of lung abscess, actinomycosis and goiter, excision of the lesion was the preferable treatment, so that the number of cases in which operation was proven to be justified was raised to 12 (66 per cent), even though resection was not possible in all the cases of carcinoma.

Annals of Internal Medicine, Lancaster, Pa.

34:311-558 (Feb.) 1951

Treatment of Polycythemia Vera with Radioactive Phosphorus. B. K. Wiseman, R. J. Rohn, B. A. Bouroncle and W. G. Myers.—p. 311.

*Methyl Alcohol Poisoning. A. H. Keeney and S. M. Mellinkoff.—p. 331.

Acute Hemorrhage from Peptic Ulceration: Analysis of 322 Cases. A. B. Chinn and E. C. Weckesser.—p. 339.

Comparison of Clinical and Pathologic Aspects of Coronary Artery Disease in Men of Various Age Groups: Study of 950 Autopsied Cases from the Armed Forces Institute of Pathology. W. M. Yater, P. P. Welsh, J. F. Stapleton and M. L. Clark.—p. 352.

*Treatment of Chronic Blood Donor Anemia. J. C. Bateman.—p. 393.

Voluntary "Unilateral Breathing." E. Rothstein and R. Strzelczyk. —p. 401.

*Treatment of Chronic Congestive Cardiac Failure with Ion Exchange Resins. E. E. Kleiber and G. Pickar.—p. 407.

Acute Porphyria. A. M. Goldman and M. H. Kaplan.—p. 415.

Responses of Abnormal Arterial Circulation to Various Stimuli, as Studied by Use of Radioactive Sodium: II. Intraarterial Histamine, Papaverine, Aminophylline and Adrenaline; Sympathectomy and Etamon; Pain. I. Mufson.—p. 428.

Calcific Aortic Stenosis Simulating Acute Coronary Thrombosis with Myocardial Infarction. I. C. Brill and E. E. Rosenbaum.—p. 442.

Typhus at Belsen: II. Clinical Course of Epidemic Typhus in Persons Who Had Received Craigie Typhus Vaccine. W. A. Davis.—p. 448.

Liver and Spleen Visualization by Simple Roentgen Contrast Method. S. Zelman.—p. 466.

Methyl Alcohol Poisoning.—The occurrence of methyl alcohol poisoning is reported in 23 soldiers or merchant seamen who had been drinking Korean sake. Samples of this beverage were examined and observed to contain 16 per cent methyl alcohol. The first five of these patients died of respiratory arrest after several hours of coma. The sixth patient was brought to the hospital in profound shock and died within four hours. Necropsy was performed in these six cases, and the essential pathologic findings were as follows: the brains showed edema and hyperemia; varying degrees of gastritis were observed in all cases, and multiple acute duodenal ulcers in one; the lungs uniformly showed varying degrees of congestion, edema, patchy atelectasis and frothy debris within the bronchial passages; the kidneys in four cases showed marked congestion of the glomerular tufts and cloudy swelling of the convoluted tubes; five of the livers were grossly fatty and microscopically contained lipoid vacuoles. The pancreas was affected in only one instance. The remaining 17 patients were managed with primary attention to acidosis. In this group there was only one death and no blindness or residual visual impairment. Ten, with only mild symptoms of intoxication and urinary pH's of 5.5 had negative blood methanol reactions and no acetonuria. These patients were treated with 6 Gm. of sodium bicarbonate every two hours. Each of these men returned to duty the following morning and none had sequelae. Four other patients, with mild epigastric discomfort and moderate acidosis but negative methanol blood determinations were hospitalized for a period of two days. Urinalysis was done every two hours, and sodium bicarbonate was given orally in doses of 6 to 8 Gm. every two hours. The patients were encouraged to eat heartily, and fluids were forced by mouth. All acetonuria permanently disappeared within 10 hours after admission, and hyperemia (2 +) of the disks, observed in only one patient, disappeared by the second day. Three patients with serious acidosis, blurring of central vision and marked congestion of the optic disks were hospitalized with blood methanol levels of 5, 12 and 39.7 mg. per 100 cc. respectively. Urinary pH ranged between 3.5 and 5.0. All showed acetonuria (3 + or 4 +). Gastric lavage was performed in each case, and sodium bicarbonate was given hourly by Levine tube until the patients were sufficiently cooperative to take the drug by mouth. It is noteworthy that in one patient acetonuria disappeared following each daily glucose infusion for three days, only to return each night when only sodium bicarbonate was being given, and no glucose was being administered. The two basic mechanisms of poisoning are direct chemical irritation of tissues and systemic acidosis. The former is influenced by the unlimited miscibility of methanol with water and the distribution of water in the tissues of the body. Acidosis is the most important therapeutic consideration. Alkalinization should be prompt and vigorous. It is suggested that intravenously administered glucose may be an important adjunct to treatment.

Treatment of Chronic Blood Donor Anemia.—Studies were made of 11 men between the ages of 34 and 57 with severe anemia caused by multiple blood donations. One of the patients had sold his blood approximately 24 times in one year, and similar histories were subsequently elicited from the other patients. Four patients had respiratory complaints. Severe weakness was the chief complaint of the remaining seven patients, and it was accompanied by dizziness in three and fainting spells in three. The anemia was characterized by hypochromia, low plasma iron levels, absence of appreciable reticulocytosis and, in most patients, by microcytosis. These observations suggested exhaustion of body iron stores. Iron therapy by mouth (from 0.4 to 3.0 Gm. of ferrous sulfate daily) produced dramatic responses. A high protein diet alone was ineffective but, when given in conjunction with iron, accelerated hemoglobin regeneration in some cases.

Ion Exchange Resins in Congestive Cardiac Failure.—Seven patients with chronic edema of cardiac origin were treated with ion exchange resins. The cation exchanger used in this study was a carboxylic resin in the hydrogen cycle. It is a fine, whitish insoluble powder of a sandy consistency and without any unpleasant odor or taste. Two heaping teaspoonfuls of the resin were administered three times daily in water. Since the resin prevents absorption of sodium into the body, rather than removing excessive tissue sodium, it is necessary to use the drug for prolonged periods and, in addition, to continue at least for a time administration of diuretics for promoting excretion of sodium. The resins have the advantage of allowing a patient to eat a more normal diet, free from the monotony of extreme sodium restriction, and the mercurial diuretics can be spaced more widely, thus reducing the number of injections. Three patients refused to continue the treatment because of intolerable burning in the stomach or because of repugnance to the dose. Four patients, who were able to take the drug for periods of two weeks to several months, showed some improvement, dramatic in at least one of them. Results were sufficiently encouraging in patients with so-called "irreversible" congestive failure no longer responsive to orthodox drugs to merit further study. The drug may also prove to be useful in patients who have recurrent free fluid in pleural or abdominal cavities, in patients who, because of their home conditions or because they have restaurant meals, are unable to adhere to a truly low sodium diet, in the severe hypertensive who is psychologically unfit for a low sodium diet or is unable to obtain it and in the cirrhotic patient with hepatic failure and edema.

Cancer Research, Chicago

11:73-152 (Feb.) 1951

Growth Characteristics of Free Tumor Cells Transferred Serially in Peritoneal Fluid of Mouse. H. Goldie and M. D. Felix.—p. 73.
Changes in Cell Morphology and Histochemistry of Testis Following Irradiation and Their Relation to Other Induced Testicular Changes: II. Comparison of Effects of Doses of 1,440 r and 5,050 r with 300 r. L. C. Fogg and R. F. Cowing.—p. 81.
Chemical Alterations Induced in Mouse Liver Following Single Feeding of Carbon Tetrachloride. K. K. Tsuboi, R. E. Stowell and C. S. Lee. —p. 87.
Spontaneous Gastric Neoplasia in Mice of Br-S Strain: Incidence and Genetic Linkage Tests. L. C. Strong and W. F. Hollander.—p. 94.
Studies on Formation of Protein-Bound Derivatives of 3,4-Benzpyrene in Epidermal Fraction of Mouse Skin. E. C. Miller.—p. 100.
Anti-Leukemic Action of Combinations of Certain Known Anti-Leukemic Agents. H. E. Skipper, J. B. Chapman and M. Bell.—p. 109.
Neoplasms in Rats Treated with Pituitary Growth Hormone: IV. Pituitary Gland. A. A. Koneff, H. D. Moon, M. E. Simpson and others.—p. 113.
Phosphorylated Intermediates in Glycolysis of Analogous Mouse Mammary Tumors: I. Mouse Mammary Tumors of dba and C3H Strains. A. Goldfeder and H. G. Albaum.—p. 118.
Effects of Injections of Lyophilized Normal and Neoplastic Mouse Tissues on Growth of Tumor Homoiotransplants in Mice. N. Kaliss and G. D. Snell.—p. 122.
Effect of Tumors on Antibody Levels in Mice. D. R. A. Wharton, G. L. Miller, M. L. Wharton and others.—p. 127.
Effect of Foster Nursing on Growth of Transplantable Tumor. M. K. Barrett and M. K. Deringer.—p. 134.
Vascularity of Normal and Neoplastic Grafts in Vivo. R. G. Williams. —p. 139.
Observations on Inhibition of Nucleic Acid Synthesis Resulting from Administration of Nitrogen Mustard, Urethane, Colchicine, 2,6-Diaminopurine, 8-Azaguanine, Potassium Arsenite, and Cortisone. H. E. Skipper, J. H. Mitchell Jr., L. L. Bennett Jr. and others.—p. 145.

Diseases of Chest, Chicago

19:125-248 (Feb.) 1951

*Surgical Repair of Mitral Insufficiency. (Preliminary Report). C. P. Bailey, T. J. E. O'Neill, R. P. Glover and others.—p. 125.
Serum Concentrations of Para-Aminosalicylic Acid (PAS) Produced by Various Forms of PAS. D. K. Duncan, D. T. Carr, K. H. Pfuetze and M. H. Power.—p. 138.
Pathology of Tuberculosis Treated with Streptomycin: Review of 34 Cases. O. Auerbach, L. Weiss and G. N. Stemmermann.—p. 145.
Effect of Heat on Streptomycin and Para-Aminosalicylic Acid in Tuberculosis Culture Medium. M. C. Drummond, G. T. Lewis and M. M. Cummings.—p. 158.
*Spontaneous Rupture of Esophagus. M. E. Flipse.—p. 165.
Diffuse Bilateral Fibrocystic Disease of Lungs (Honey-Comb Lungs). L. Hyde, B. Hyde and C. Pokorny.—p. 190.
Bronchogenic Carcinoma Masked by Pulmonary Tuberculosis: Case Report. J. R. Phillips and J. W. Morrison.—p. 201.
Mediastinal Teratoma. F. T. Fralick and H. S. Welsman.—p. 209.
Cysts of Pleura. W. L. Craddock.—p. 221.
Case of Plasmacytoma of Lung. M. Kuley and O. Kuntman.—p. 227.
Obstructions of Superior Vena Cava. L. H. Ferguson Jr. and W. A. Werner.—p. 234.

Surgery in Mitral Insufficiency.—Bailey and co-workers have developed a surgical technique that is immediately effective in controlling serious mitral regurgitation of either pathologic or surgical origin. This consists of the insertion of a pedicled pericardial graft with intact blood and nerve supply completely through the left ventricle in such a way as to form a flap or sling valve that tamponades the mitral orifice at each ventricular systole. The graft must lie close to the valve orifice, must be reasonably loose and preferably running accurately through the network of the chordae tendinae grouped at either extremity of the mitral slit. After preliminary animal experiments the method was applied to seven patients with pronounced mitral regurgitation. All had single valve lesions, and all were in a state of complete cardiac compensation prior to surgery. In two of the patients, who had both mitral stenosis and insufficiency, commissurotomy to relieve the stenosis was the first step in the operative procedure. The operation was considered successful in six of the seven patients, since the regurgitant leak palpable by the finger placed in the heart was diminished by at least 75 per cent. In three patients the leak was considered to be completely controlled. In one patient there was little or no control of the regurgitation, probably because of improper placement of the graft. There were no deaths. More time is necessary to permit conclusions on the permanent effectiveness of such grafts.

Spontaneous Rupture of Esophagus.—The occurrence of spontaneous rupture of the esophagus is reported in two men aged 43 and 68. Both patients died, one 24 hours after the onset of excruciating pain in the upper abdomen and subxiphoid area, the other 10 days after the onset of moderately severe substernal pain. Diagnosis was made on necropsy. Only 13 of the approximately 100 patients with spontaneous rupture of the esophagus listed in world literature have survived. This rupture is due to an increase in intraesophageal pressure greater than the tensile strength of the esophagus. Increased intraesophageal pressure is due to the transmission of increased intra-abdominal pressure by the stomach contents through the cardia into the esophagus. Rupture is made more likely by distention of the stomach with food or fluid and by obstruction of the esophagus. Obstruction is usually physiological, produced by the complex anatomical make-up of the esophagus and by incoordination of the complex vomiting reflex. Esophagitis, simple ulcer of the esophagus and esophagomalacia weaken the esophagus and so predispose to rupture. Rupture is seen chiefly in association with vomiting and/or retching, alcoholism and diseases of the central nervous system. There is usually a linear tear in the lower third of the esophagus that leads to the rapid development of mediastinitis and/or hydropneumothorax. The 70 per cent mortality rate in the first 24 hours is due to the violence of the mediastinitis and pleuritis and to the interference with cardiorespiratory function from mechanical compression. The clinical picture of spontaneous rupture of the esophagus varies somewhat, depending on whether it occurs in a previously normal person or in a neurosurgical patient. In the former, symptoms come on after vomit-

ing and/or retching and consist of sudden chest pain, collapse, respiratory distress, upper abdominal rigidity and later subcutaneous emphysema. In postcraniotomy patients, vomiting of blood occurs during recovery from anesthesia; consciousness is lost, and there is progressive restlessness, cyanosis and dyspnea, with increasing temperature, pulse and respiratory rates. Definite diagnosis can be made by the roentgenologic observation of the passage of radio-opaque mediums through the rent into the mediastinal and pleural spaces or by aspiration of stomach contents from the pleural space. Mediastinal emphysema, rapidly accumulating hydrothorax and a retrocardiac air bubble and fluid level are suggestive roentgenologic findings. The correct antemortem diagnosis might have been made in the author's second patient, representing an example of spontaneous rupture due to esophagomalacia secondary to cerebral arteriosclerosis, had the significance of the progressive widening of the mediastinal shadow been appreciated. Prompt transpleural repair of the rent is the method of choice in early cases of spontaneous rupture of the esophagus. In the rest, drainage of mediastinal and pleural spaces is indicated. The most important of the supportive measures are the decompression of any tension pneumothorax or high pressure mediastinal emphysema and antibiotic therapy.

Florida Medical Association Journal, Jacksonville

37:475-534 (Feb.) 1951

Modern Psychiatry from the Practitioner's Standpoint. L. S. Selling. —p. 491.
Fatal Aplastic Anemia Associated with Mesantoin: Report of Case with Autopsy. S. Stillman, S. G. Bedell and D. Leavitt.—p. 496.
Review of Antibiotics in Treatment of Diseases of Chest. A. Libow. —p. 498.
Causes of Embolism. D. E. Hallstrand.—p. 503.

37:539-610 (March) 1951

Recurrent Nonspecific Pericarditis. W. Stamps.—p. 555.
A Physician's Place in His Community. C. E. Tribble.—p. 558.
Case of Tetralogy of Fallot with Both Coronary Arteries Arising from the Pulmonary Artery. J. W. Williams, W. S. Johnson and J. R. Boulware Jr.—p. 561.
Cytologic Diagnosis of Cancer: Method of Papanicolaou. M. M. Sayet. —p. 563.

Gastroenterology, Baltimore

17:133-326 (Feb.) 1951

Hysterical Abdominal Proptosis. N. J. Roussak.—p. 133.
Electrophoretic Serum Protein Fractions in Hepatobiliary Disease. H. Popper, W. B. Bean, J. de la Huerga and others.—p. 138.
One Hundred Cases of Carcinoma of Pancreas: Clinical and Roentgenologic Analysis. T. R. Broadbent and H. D. Kerman.—p. 163.
Effect of Banthine on Central Nervous System. L. M. Asher and S. Cohen.—p. 178.
"Latent" Portal Cirrhosis. W. E. Ricketts and J. B. Kirsner.—p. 184.
Squamous Cell Carcinoma of Rectum. S. D. Kron, H. A. Wurzel and R. J. Chodoff.—p. 194.
Experimental and Preliminary Clinical Study of Effect of New Quarternary Amine, Banthine, upon Human Colon. F. Kern Jr., T. P. Almy and N. J. Stolk.—p. 198.
Studies of Portal Venous System by Injection Technique. R. O. Holmes and W. V. Lovitt.—p. 209.
Clinical Evaluation of Bentyl Hydrochloride, New Antispasmodic. D. T. Chamberlin.—p. 224.
Turbidimetric Studies of Serum Colloids in Diabetes Mellitus. J. Pomeranze.—p. 226.
Comparative Study of Colloidal Red, Thymol Turbidity and Cephalin-Cholesterol Flocculation Tests. C. R. McIntire, R. D. Pickett, B. D. Rosenak and R. H. Moser.—p. 231.
*Insulin Tolerance Test in Cirrhosis of Liver. S. O. Waife, L. O. Brenner and C. M. Thompson.—p. 236.
Use of Secretin Test in Diagnosis of Biliary Tract Disease: Report of 227 Case Studies. D. A. Dreiling and J. J. Lipsay.—p. 242.
Effect of Interrupting Blood Flow on Gastric Potential and HCl Secretion. F. E. Coy Jr., F. J. Bajandas, T. P. de Graffenreid II and W. S. Rehm.—p. 260.

Insulin Tolerance Test in Cirrhosis of Liver.—When insulin is administered to normal subjects glycogenolysis in the liver is accelerated, so that the blood sugar is maintained at normal levels. Since the damaged liver in cirrhosis is partially depleted of glycogen, it seemed to Waife and associates that the glycemic response to a small dose of insulin might (1) test that organ's ability to maintain normal levels of blood sugar, i. e., a test for a specific liver function, and (2) throw some light on the role of the liver in carbohydrate metabolism. The standard insulin tolerance test was performed on 16 patients with advanced cirrhosis of the liver. Regular insulin was administered intravenoulsy in a dose of 0.1 unit per kilogram of body weight. Venous blood was drawn at 0, 15 or 20, 30, 45, 60, 90, and 120 minutes after the insulin had been given following an overnight fast preceded by a high carbohydrate intake the day before. The insulin tolerance test was performed also on seven convalescing patients, who had no evidence of liver disease, on four patients with psychosis and on a healthy active woman after she had been fasting for 20 and 40 hours. The mean of the 16 cirrhotic insulin tolerance curves was abnormal. In the first part of the curve there is evidence that cirrhotic patients are "insulin resistant." Hypoglycemic unresponsiveness characterizes the later part of the curve; that is, cirrhotic patients tend to have a definite flattening of the blood sugar response to insulin. Although the four psychotic patients had normal insulin sensitivity the mean curve shows a tendency to hypoglycemic unresponsiveness. Starvation was found to cause some insulin resistance. This suggests that the insulin resistance of cirrhotic persons may be due to what is essentially a state of starvation, because of impaired utilization of foods even in the presence of an adequate oral intake, and that the hypoglycemic unresponsiveness is unrelated to glycogen stores. The authors feel that the relatively wide scatter in curves unrelated with the clinical picture makes this test not specific enough for prognostic use.

Georgia Medical Association Journal, Atlanta

40:41-94 (Feb.) 1951

Treatment of Intractable Dysmenorrhea by Presacral Sympathectomy. A. L. Evans and O. S. Cofer.—p. 41.
*Diagnosis and Preoperative Management of Congenital Esophageal Atresia and Tracheo-Esophageal Fistula. O. A. Abbott and W. A. Hopkins. —p. 44.
Fasciotomy in Treatment of Gravitational Leg Ulcers. C. K. Wall.—p. 59.
Lesions of Shoulder. P. L. Rieth.—p. 69.
Melanoma. I. H. Trincher, R. L. Brown and E. L. Bishop.—p. 70.
Chloromycetin in Infectious Mononucleosis. R. F. Payne and F. Crenshaw.—p. 75.
Present Status of Management of the Rh Negative Pregnant Woman. W. H. Browne.—p. 76.

Congenital Esophageal Atresia and Tracheoesophageal Fistula.—Congenital abnormalities of the trachea and esophagus are no longer considered a rarety. Twenty infants, 15 male and five female, are reported on, of whom 17 had congenital tracheoesophageal fistulas associated with esophageal atresia. An H-type of fistula between the esophagus and trachea without associated atresia of the esophagus was observed in three patients. The diagnosis was made 24 hours after birth in two patients, during the second day of life in five patients and between the seventh and tenth day of life in 13 patients. Diagnosis may usually be made by the passage of a soft rubber catheter under fluoroscopic vision; contrast mediums need rarely be used and, if used, consist only of 0.5 to 1 cc. of iodized oil (lipiodol®). In about half the patients cyanosis and breathing difficulty was noted at birth. Salivation was a prominent symptom in all patients over 24 hours old. Secondary pulmonary complications, such as atelectasis and pneumonia, made the pulmonary pathology the outstanding symptom with increase in age of the infant. Eight of the 20 patients had coincident anomalies, such as imperforate anus, tetralogy of Fallot and duodenal atresia. In three of these patients the associated anomalies precluded any chance of survival. Most of the patients were operated on approximately 24 hours after the diagnosis was made. The chances of survival decrease in proportion to the delay in diagnosis and the degree of secondary pulmonary contamination. With improvement in the authors' methods of preoperative preparation and operative technique nine of the last 12 patients operated on could be saved. Bigger's principle of gastrostomy as a method of deflation of the gastrointestinal tract may prove to be a valuable adjunct to direct attack on the fistula 24 hours later. Primary end to end anastomosis according to Haight's method should be performed only when the situation appears completely satisfactory for this procedure. The methods suggested by Levin and Ladd should be utilized in those instances wherein a direct anastomosis is not

possible. The authors do not feel that a diagnosis of tracheoesophageal fistula with esophageal atresia indicates an emergency operative procedure. If any evidence of pulmonary disease is present they prefer to use 12 to 24 hours for preparatory measures, including treatment with antibiotic drugs. In patients in whom diagnosis is made within the first 48 hours of life and in whom the pulmonary status appears normal, immediate operation is indicated.

Geriatrics, Minneapolis

6:1-72 (Jan.-Feb.) 1951

Hypoadrenocorticism in Alcoholism and Drug Addiction. H. W. Lovell and J. W. Tintera.—p. 1.
Arteriectomy for Arterial Obstruction in Extremities. N. Shnayerson. —p. 12.
Steroid Hormones in Geriatric Practice. J. L. DeCourcy and C. B. DeCourcy.—p. 28.
Manifestations of Psychoneuroses Occurring in Later Life. H. E. Clow and E. B. Allen.—p. 31.
Some Basic Principles of Geriatric Anesthesia. M. L. Bernstine.—p. 40.
Better Bread as Source of Protein and Calcium for the Aged. C. M. McKay.—p. 45.

Indiana State Medical Assn. Journal, Indianapolis

44:93-172 (Feb.) 1951

Potentialities and Limitations of Sympathetic Nerve Surgery. H. B. Shumacker Jr.—p. 113.
Treatment of Sterility. S. L. Israel and L. L. Weber.—p. 119.
Rabies in Indiana: Human Case. J. W. Jackson.—p. 123.
Full Term Abdominal Pregnancy with Delivery of Living Child. E. L. C. Broomes.—p. 127.

International Journal of Leprosy, New Orleans

18:451-570 (Oct.-Dec.) 1950. **Partial Index**

*Thiosemicarbazone (TB-1) in Treatment of Leprosy: Preliminary Communication. M. Vegas, J. Convit, J. A. Medina and E. de Blomenfield.—p. 451.
Sulfone Treatment of Tuberculoid Leprosy. J. Lowe.—p. 457.
Treatment of Leprosy with Chloramphenicol: Experimental Trial with Negative Results. V. Pardo-Castello, F. Trespalacios, F. R. Tiant and others.—p. 469.
Interpretation of Calcium Protein Findings in Sera of Lepra Reaction Cases by Means of McLean-Hastings Equation. E. M. Paras.—p. 473.
Modifications of Lepromin Reactions. D. G. Basombrio, J. C. Gatti, J. E. Cardama and C. V. Colombo.—p. 481.
Reactions to Lepromin in Man: I. Suggestion of Possible Desensitization of Early Reaction. H. W. Wade.—p. 487.
Lesions Provoked in Wild Rat by Inoculation of Hansen Bacillus: Histologic Study. R. Noël and M. S. Soeur.—p. 493.

Amithiozone in Leprosy.—At the Cabo Blanco leprosarium in Venezuela, amithiozone (thiosemicarbazone, TB-1) is being tried in the treatment of leprosy. So far, 42 patients have been treated for periods of three to six months (March to September 1950). The initial results indicate considerable therapeutic activity. There was notable clinical regression of leprous lesions. No manifestations of intolerance were observed, and no blood changes or disturbances of the liver or other viscera occurred. The authors believe that much benefit may be derived from the application of amithiozone in the treatment of leprosy.

Journal of Aviation Medicine, St. Paul

22:1-86 (Feb.) 1951

Medical Aspects of "Operation Vittles." R. D. Nauman.—p. 4.
Relation of Circulatory Rate to Aeroembolism and Aeroemphysema. J. W. Wedral and A. C. Ivy.—p. 13.
Studies in Diffusion Respiration. T. Shires and S. W. Eyer.—p. 22.
Significance of Loss of Blood Volume into Limbs During Pressure Breathing. J. P. Henry.—p. 31.
Human Decelerator. H. M. Sweeney.—p. 39.
Human Tolerance to Deceleration: Summary of 166 Runs. J. P. Stapp. —p. 42.
The Navy Ejectable Cockpit. J. C. Early.—p. 46.
Biochemical and Blood Pressure Changes in Goats Under Negative G (Acceleration Tailward). R. S. Pogrund, S. W. Ames and C. F. Lombard.—p. 50.
Effect of Increased Positive Radial Acceleration upon Perceptual Speed Ability. A. L. Comrey, A. A. Canfield, R. C. Wilson and W. S. Zimmerman.—p. 60.
Typical Navy Flight Surgeon. J. Dunlap and W. E. Kellum.—p. 65.
Photoelectric Hypoxia Warning Device. K. Kramer, D. E. Timmons and H. Mayne.—p. 70.

Journal of Clinical Investigation, Cincinnati

30:1-124 (Jan.) 1951

Nature of Circulating Thyroid Hormone in Graves' Disease. I. N. Rosenberg.—p. 1.
Mechanism of Hemolysis in Paroxysmal Cold Hemoglobinuria: I. Role of Complement and Its Components in Donath-Landsteiner Reaction. W. S. Jordan Jr., L. Pillemer and J. H. Dingle.—p. 11.
Id.: II. Observations on Behavior and Nature of Antibody. W. S. Jordan Jr., L. Pillemer and J. H. Dingle.—p. 22.
Direct Action of Vitamin B_{12} upon Human Bone Marrow: Effect of Instillations of Vitamin B_{12} and Folic Acid into Bone Marrow as Studied by Nucleic Acid Staining Techniques. D. Horrigan, T. Jarrold and R. W. Vilter.—p. 31.
Neural Mechanisms Involved in Itch, "Itchy Skin," and Tickle Sensations. D. T. Graham, H. Godell and H. G. Wolff.—p. 37.
Effect of Oral Administration of Calcium Fructose Diphosphate on Serum Organic Phosphate, Inorganic Phosphate, Calcium, Protein, and Citric Acid Levels. S. Natelson, M. Klein and B. Kramer.—p. 50.
Clinical Determination of Protein-Bound Iodine. S. B. Barker, M. J. Humphrey and M. H. Soley.—p. 55.
Studies of Antidiuresis of Quiet Standing: Importance of Changes in Plasma Volume and Glomerular Filtration Rate. F. H. Epstein, A. V. N. Goodyer, F. D. Lawrason and A. S. Relman.—p. 63.
Studies in Glycine-2-C^{14} Metabolism in Man: I. Pulmonary Excretion of $C^{14}O_2$. N. I. Berlin, B. M. Tolbert and J. H. Lawrence.—p. 73.
Effect of Platelet Extract on Hemophilic Blood. E. Mond and K. Singer. —p. 77.
Peptidase Activity in Leucocytes, Erythrocytes and Plasma of Young Adult and Senile Subjects. K. Stern, M. K. Birmingham, A. Cullen and R. Richer.—p. 84.
Effect of Bilateral Stellectomy upon Cerebral Circulation of Man. H. A. Shenkin, F. Cabieses and G. van den Noordt.—p. 90.
Effect of Venous and Arterial Occlusion, and Sympathetic Nerve Tone, on Digital Blood Flow. M. Mendlowitz, A. S. W. Touroff and H. A. Abel.—p. 94.
Chemical, Clinical, and Immunological Studies on Products of Human Plasma Fractionation: XL. Quantitative Separation and Determination of Protein Components in Small Amounts of Normal Human Plasma. W. F. Lever, F. R. N. Gurd, E. Uroma and others.—p. 99.
Proteolytic Enzymes and Platelets in Relation to Blood Coagulation. B. L. Travis and J. H. Ferguson.—p. 112.

Journal Nat. Cancer Inst., Washington, D. C.

11:239-452 (Oct.) 1950. **Partial Index**

Study of Golgi Material and Mitochondria in Malignant and Benign Prostatic Tissue. A. E. Bothe, A. J. Dalton, W. S. Hastings and F. O. Zillessen.—p. 239.
Observations on Effect of Thymectomy on Spontaneous Leukemias in Mice of High-Leukemic Strains, RIL and C58. L. W. Law and J. H. Miller.—p. 253.
Relation of Lethal Yellow (A^y) Gene to Pulmonary Tumor Formation and Obesity in Inbred Strain of Mice. W. C. Morgan.—p. 263.
Action of Bacterial Toxins on Tumors: VIII. Factors in Their Use for Cancer. P. A. Zahl.—p. 279.
Partition of Radiophosphorus (P^{32}) in Blood, Urine, and Tumor Tissue in Patients with Hodgkin's Disease and Lymphosarcoma Before and After Treatment with Nitrogen Mustard (Methyl Bis [Beta-Chloroethyl] Amine). S. P. Masouredis, B. V. A. Low-Beer, H. R. Bierman and others.—p. 289.
Ascorbic Acid, Dehydroascorbic Acid, and Diketogulonic Acid of Transplanted Melanomas and of Other Tumors of Mouse. H. M. Dyer and H. E. Ross.—p. 313.
Studies on Mechanism of Action of Chemotherapeutic Agents in Cancer: IV. Relationship of Guanine and Guanylic Acid to Action of Guanazolo on Lymphoid Tumors in Mice and Rats. A. Goldin, E. M. Greenspan and E. B. Schoenbach.—p. 319.
Production of Malignancy in Vitro: XII. Further Transformations of Mouse Fibroblasts to Sarcomatous Cells. K. K. Sanford, W. R. Earle, E. Shelton and others.—p. 351.
Transplantation Studies on Induced Fibrosarcoma in Rats: II. Influence of Sex Hormones and Repeated Transplantation on Tumor Immunity. M. Klein.—p. 381.
Histologic Changes in Strain C Mice Following Long-Term Ingestion of Thiouracil. A. J. Dalton, H. P. Morris, M. J. Striebich and C. S. Dubnik.—p. 391.
Carcinogenic Action of Mustards. W. E. Heston.—p. 415.
*Influence of Thymectomy on Incidence of Carcinogen-Induced Leukemia in Strain DBA Mice. L. W. Law and J. H. Miller.—p. 425.
Finer Structure of Hepatic, Intestinal and Renal Cells of Mouse as Revealed by Electron Microscope. A. J. Dalton, H. Kahler, M. J. Striebich and B. Lloyd.—p. 439.

Thymectomy and Induced Leukemia.—Removal of the thymus at 4 weeks of age in strain dba mice reduced the incidence of lymphoid leukemia induced by methylcholanthrene from 69.7 to 22.0 per cent. Removal of the spleen or transplantation of either one or two thymuses into intact dba mice at 4 weeks of age did not significantly change the incidence of induced lymphoid leu-

kemias from that in control animals. Thymectomy followed by immediate autoplastic grafting of the thymus into the right axilla resulted in an incidence of induced leukemia of 69.1 per cent. Since thymectomized mice of strain dba bearing autoplastic grafts of the thymus show an incidence of induced leukemia (69.1 per cent) similar to that of the intact control mice (69.7 per cent), it appears that the presence of thymic tissue in the body is a necessary antecedent to the development of leukemia in a very high percentage of mice, even though the thymic tissue does not appear to participate actively in the conversion of a normal cell to a malignant cell. The absence of thymic tissue did not, however, significantly change the incidence of other types of tumors induced by methylcholanthrene, e. g., skin carcinomas and mammary tumors. The possible role of the thymus in the conversion of lymphoid cells from normal to neoplastic is discussed.

Journal of Nervous and Mental Disease, New York

113:1-94 (Jan.) 1951

Conditioning of Respiration and Its Psychosomatic Implications. B. Freedman.—p. 1.
Bilateral Symmetrical Necrosis of Corpora Striata: Report of Fatal Case and Reference to Possible Syndrome of Corpora Striata. W. A. Hawke and W. L. Donohue.—p. 20.
Technique of Histamine Biochemotherapy and Suggestions for Its Use in Psychiatry. M. D. Sackler, R. R. Sackler, A. M. Sackler and J. H. W. Van Ophuijsen.—p. 40.
Influence of Frontal Topectomy upon Gastric Secretion (Review of Data on 24 Cases and 14 Controls). M. B. Carpenter.—p. 52.
*Paralysis from Tetanus Antitoxin. L. B. Davis.—p. 61.

Paralysis from Tetanus Antitoxin.—Davis presents the case of a youth, aged 18, who ran a splinter into his right thumb. This splinter was removed, and, because of the possibility of manure contamination, 1,500 units of tetanus antitoxin were given into the left arm, after the usual intradermal sensitivity test, which was negative. Nine days after the accident, the patient had a severe delayed serum sickness, with urticaria, erythema, conjunctivitis and arthralgia. With the onset of this reaction he noticed a severe pain in his right shoulder. This persisted as an ache with a gradually increasing weakness. At the end of three months he was unable to raise the arm to shoulder height. Examination showed 50 per cent loss of arm abduction and winging and elevation of the right scapula with severe atrophy of the muscles supplied by the fifth and sixth cervical nerves. Under physiotherapy and treatment with vitamin B compound, there was gradual improvement, the muscles being restored to full use after eight months. The author briefly discusses four types of serum neuritis: radicular, neuritic, polyneuritic and central, and says that other serums and vaccines may cause this condition although more than half of the cases are caused by tetanus antitoxin. It is suggested that the new antihistamine drugs be used after injection of tetanus antitoxin either as soon as the symptoms of delayed serum sickness begin, or prophylactically from the sixth to the twelfth day after the injection. The efficacy of this procedure remains to be proved. Complete recovery usually results, but a small percentage of patients have residual paralysis. Fear of this should not discourage the use of tetanus antitoxin.

J. Pharmacology & Exper. Therap., Baltimore

101:119-242 (Feb.) 1951. **Partial Index**

Salicylamide: Pharmacology, Fate and Clinical Use. M. Litter, A. R. Moreno and L. Donin.—p. 119.
Certain Aspects of Vasopressor Action of Pilocarpine. M. A. Root. —p. 125.
Effect of Antihistamine Drugs on Adrenal Cortical Response to Histamine and to Stress. J. Tepperman, N. Rakieten, J. H. Birnie and H. F. Diermeier.—p. 144.
Renal Hemodynamic Effects of Phenylephrine (Neosynephrine) Hydrochloride in Man. A. P. Crosley Jr., J. K. Clark and H. G. Barker. —p. 153.
Chemical Correlatives of Digitalis Potency in Man, Cat and Pigeon. L. J. Sciarini and W. T. Salter.—p. 167.
Effect of Naphthoquinones on Schistosoma Mansoni in Vitro and in Vivo. E. Bueding and L. Peters.—p. 210.
Adsorption of Digestive Enzymes by Sulfonamides. G. Cronheim and J. S. King Jr.—p. 230.

Journal of Thoracic Surgery, St. Louis

21:111-216 (Feb.) 1951

Pneumonectomy with Replantation of Lung in Dog for Physiologic Study. A. A. Juvenelle, C. Citret, C. E. Wiles Jr. and J. D. Stewart.—p. 111.
Surgical Treatment of Three Cases of Pleural Sarcoma. S. Ramström and H. Hellsten.—p. 116.
Reconstruction of Defects of Thoracic Wall with Tantalum Mesh Gauze (Preliminary Report of Two Cases). A. E. W. Ada and E. P. Hevenor. —p. 125.
Observations on Division of Adhesions in Opaque Lobes. A. J. Coello. —p. 135.
Angiocardiographic Findings in Thoracoplasty, Artificial Pneumoperitoneum, and Phreniclasia. H. I. McCoy, I. Steinberg and C. T. Dotter. —p. 149.
*Successful Repair of Aortic Aneurysm with Sternal Perforation. R. A. Cowley, H. E. Sloan and N. H. Sullenberger.—p. 159.
Diagnostic Value of Dynamic Studies in Angiocardiography: Evaluation of New Rapid Technique. T. F. Keyes, C. Wegelius and J. Lind. —p. 164.
Analysis of Variations in Bronchovascular Patterns of Middle Lobe in 50 Dissected and 20 Injected Lungs. E. A. Boyden and C. J. Hamre. —p. 172.
Paraganglioma Simulating Carcinoma of Esophagus. F. H. Taylor. —p. 189.
Primary Solitary Neurogenic Tumors of Lung. W. Diveley and R. A. Daniel Jr.—p. 194.
One Hundred Thirty Consecutive Thoracoplasties: Evaluation of Results in Different Types of Pulmonary Tuberculosis. P. Ottosen, C. Popp, A. J. Beatty and W. W. Buckingham.—p. 202.
Accessory Diaphragm: Case Report. T. B. Sappington Jr. and R. A. Daniel Jr.—p. 212.

Repair of Aortic Aneurysm.—Polyethylene plastic films have been used to strengthen the walls of abnormally dilated arteries since 1946. Dicetyl phosphate, a stripping agent used in the manufacture of polyethylene (polythene®) plastic films, is the factor responsible for the fibrous tissue stimulation. The woman whose case is reported had an expansile, pulsating, dome-shaped mass just below the suprasternal notch. Roentgen examinations, including a retrograde aortogram and angiocardiogram, showed an aneurysm arising from the anterior surface of the ascending and transverse aortic arch. It had eroded through the sternum and was visible subcutaneously. The aneurysm therefore had an hour glass configuration; one portion being intrathoracic, the other being extrathoracic and the constricted portion being at the level of the sternal perforation. During the operation it was not possible to invest the aneurysm completely in polyethylene, but the neck of the aneurysmal sac was invested at its base. The polyethylene film produced fibroblastic proliferation with subsequent scarring and contraction, and thus the neck of the aneurysmal sac was occluded. This presumably allowed intraluminal clotting and produced the desired effect. Four months after operation the bulge had disappeared and the skin over the sternum was flat. The bony defect in the sternum had been replaced with firm scar tissue. The wrapping of aneurysms with strips of polyethylene offers a suitable method of treating those in which other methods are hazardous because of the position of the aneurysm, friable walls and close proximity to great vessels and vital structures. Polyethylene strips are superior to whole sheets of polyethylene, because they can be more closely applied to all parts of the vessel wall to be covered.

Maine Medical Association Journal, Portland

42:37-66 (Feb.) 1951

Case of Sigmoidovesical Fistula in a Male 39 Years of Age. A. H. McQuillan.—p. 37.
Severe Head Injury with Fracture of Skull and Facial Paralysis: Case Report. J. F. Reynolds and F. T. Hill.—p. 39.
Gastro-Intestinal Bleeding Associated with Hiatus Hernia. F. B. Chaplin and J. O. Piper.—p. 40.
Roentgenologic Aspects of Polyposis of Gastrointestinal Tract. M. F. Lubell.—p. 44.
ACTH and Cortisone in Ophthalmology. H. F. Hill, R. H. Dennis and C. E. G. Shannon.—p. 47.
The Laboratory in ACTH and Cortisone Therapy. I. I. Goodof.—p. 49.
Early Recognition of Strabismus: Plea for Prevention of Partial Blindness in One Eye. R. H. Dennis.—p. 50.
Clinical Use of ACTH and Cortisone. G. J. Robertson.—p. 53.
Dizziness and Vertigo in Daily Practice. L. W. Pratt.—p. 55.
Autochthonous Cerebral Thrombosis. C. E. Dore and I. I. Goodof. —p. 57.
The Staff Audit and the Consultation Ratio. F. T. Hill.—p. 58.
The Speech and Lip-Reading Clinic at Thayer Hospital, Waterville, Maine. E. O. Koons.—p. 61.

North Carolina Medical Journal, Winston-Salem

12:41-84 (Feb.) 1951

Recent Advances in Therapy with ACTH and Cortisone. L. I. Gardner. —p. 41.
Effect of Para-Aminobenzoic Acid (PABA) or Its Sodium Salt on Erythrocyte Sedimentation Rate in Vitro. J. C. Hayward and G. T. Harrell. —p. 47.
Treatment of Advanced Strictures of Rectum Due to Lymphogranuloma Venereum. H. M. Schiebel.—p. 49.
Recent Advances in Diagnosis and Treatment of Epilepsy. R. L. Masland and M. J. Rosenblum.—p. 53.
Preventive Psychiatry and National Mental Hygiene Program. C. G. Southard.—p. 56.
Psychological Clinic of University of North Carolina Health Service. J. G. Dawson and E. M. Hedgpeth.—p. 60.
Bulbo-Respiratory Poliomyelitis: Problems of Diagnosis and Treatment. R. B. Lawson.—p. 62.
Bronchoscopy in Diagnosis of Bronchiogenic Carcinoma. J. R. Wright. —p. 66.
Hearing Loss. R. Arnold.—p. 67.

Pediatrics, Springfield, Ill.

7:153-304 (Feb.) 1951

*Progress in Study of "Mucoviscidosis" (Pancreatic Fibrosis) with Illustrative Case Presentations. H. Shwachman.—p. 153.
Spherocytosis and Increased Fragility Occurring in Erythroblastosis Fetalis Associated with ABO Incompatibility. G. C. Robinson, R. M. Phillips and M. Prystowsky.—p. 164.
Acute Hemolytic Anemia Related to Naphthalene: Report of Case in a Newborn Infant. W. B. Schafer.—p. 172.
*Endocardial Fibroelastosis: Report of Two Cases. F. C. Collier and P. D. Rosahn.—p. 175.
Renal Carbonic Anhydrase in Premature and Mature Infants. R. Day and J. Franklin.—p. 182.
Tissue Changes in Nephrotic Syndrome: Demonstration of Potassium Depletion. C. L. Fox Jr. and L. B. Slobody.—p. 186.
Use of Aureomycin and Penicillin in Treatment of Rubeola in Pre-Eruptive and Early Eruptive Phase. S. Karelitz, H. King, B. Curtis and M. Wechsel.—p. 193.
Neurologic Complications of Herpes Zoster. A. R. Nachman.—p. 200.
Aureomycin in Treatment of Molluscum Contagiosum. R. E. Votteler. —p. 206.
Electric Bunting to Maintain Body Temperature During Exchange Transfusion in Newborn Infant. P. Vogel, R. E. Rosenfield and M. Steinberg.—p. 207.
Brain Damage in a Juvenile Diabetic Patient Associated with Insulin Hypoglycemia. L. I. Gardner and G. C. Reyersbach.—p. 210.
Therapy of Tuberculosis in Infants and Children. R. H. High.—p. 215.
*Brock Procedure for Relief of Pulmonary Stenosis in Tetralogy of Fallot. D. F. Downing, C. P. Bailey and R. P. Glover.—p. 230.
Protein-Bound Iodine in Infants from Birth to One Year of Age. T. S. Danowski, S. Y. Johnston, W. C. Price and others.—p. 240.

"Mucoviscidosis" (Pancreatic Fibrosis).—Pancreatic fibrosis is a generalized disease and may involve mucus-secreting glands in different degrees and in different parts of the body; hence the name mucoviscidosis was coined. This disease is more prevalent than is commonly realized. Until recently all patients with proved pancreatic fibrosis have died, but the prevailing pessimistic attitude toward this disease may be discarded if diagnosis is established early and the patient is given competent medical care. The most reliable diagnostic procedure is the direct examination of the duodenal fluid. The demonstration of pronouncedly reduced trypsin or lack of this substance in the duodenal fluid with an increase in viscosity is characteristic of the disease. Some patients, in whom the respiratory tract is involved to a much greater extent than the pancreas, may have normal or only slightly reduced duodenal trypsin with increased viscosity; measurement of the viscosity has proved valuable in these patients. The value of the stool trypsin test has certain limitations in these patients, assuming that the stool trypsin in small babies reflects duodenal trypsin activity. In 16 of 68 infants with pancreatic fibrosis and duodenal fluid negative for trypsin, results of the stool trypsin test were positive on one occasion. Perhaps some of these false positive stool tests are due to the presence of potent gelatin-liquefying bacteria. The author's method of treatment of pancreatic fibrosis includes high caloric diet, with protein hydrolysates in small babies; antibiotics, such as aureomycin and terramycin; pancreatin and high vitamin intake. Excellent to good results were obtained in 90 of 100 patients treated with aureomycin, while 10 patients were therapeutic failures. Results with terramycin were equally gratifying in 30 patients. Three illustrative cases are reported.

Endocardial Fibroelastosis.—Eleven cases of fibroelastosis of the endocardium found in the literature are reviewed, and two new cases in infants 7 and 3½ months old are reported. In six of these 13 cases there was a history of maternal disease during the prenatal period, and five of these six illnesses were of an inflammatory or infectious type. The age group in which this morphologic alteration was observed extended from a prematurely born infant to a child 5 years of age. Twelve of the patients were less than 27 months old, and nine were less than 5 months old. All the patients died in cardiac failure. Seven of the 13 patients had associated cardiovascular anomalies other than dilatation or hypertrophy of the cardiac chambers. Cardiac hypertrophy was observed in all but one of the 13 patients. Fibroelastic thickening of the endocardium was observed in the left ventricle of all 13 hearts. Ten showed the change in both the left ventricle and the left auricle. With the exception of the endocardial lesion, none of the usual evidences of an inflammatory reaction were present in any of the hearts. Cellular infiltrates, vascular proliferation, deposition of fibrous tissue, edema and necrosis all were absent on microscopic examination. Even the thickened endocardium occurred in an orderly arrangement of fibroelastic elements, which did not suggest that inflammation was the basic lesion. The thickened endocardium occurred diffusely throughout the heart chamber and not focally, as is so often seen after healing of a myocardial infarct. On both gross and microscopic study there was no specific change that could be cited as evidence of an inflammatory anlage in the production of this lesion. The pathogenesis of the lesion is unclear, although it is probable that the explanation lies in a developmental aberration in the fetus.

Brock Procedure for Relief of Pulmonary Stenosis.—The surgical relief of congenital pulmonary stenosis has been both direct and indirect. The indirect, shunting procedures have inherent dangers; the direct approach of Brock appears to be without these dangers, and the circulation is allowed a more normal course. Brock's approach was used by the authors in eight patients between the ages of 3 and 21 years, with tetralogy of Fallot associated with valvular stenosis in four and with infundibular stenosis in the remaining four. This approach entails an incision into the right ventricular chamber and the cutting of the stenosed pulmonary valve or the removal of obstructing tissue in the outflow tract of the right ventricle. In the four cases of infundibular stenosis, Brock's technique was modified in that a special rongeur with tapering jaws was used instead of a cutting punch for removal of obstructing infundibulum tissue. Results in these eight cases have been gratifying. Cyanosis was relieved immediately in six patients and some time after operation in one more patient. In six cases the improvement in exercise tolerance has been striking; in one there has been a definite increase. Although follow-up observation has been of short duration, there is reason to believe that the improvement will continue. Removal of the impediment to blood flow is surgically and physiologically sound and preferable to the production of a shunt. For this reason Brock's procedure must at present be considered the one of choice in cases of pulmonary stenosis.

Psychosomatic Medicine, New York

13:1-70 (Jan.-Feb.) 1951

Atopic Dermatitis: Clinical Psychiatric Study. J. G. Kepecs, A. Rabin and M. Robin —p. 1.
Relationship Between Certain Emotional States and Exudation into Skin. J. G. Kepecs, M. Robin and M. J. Brunner.—p. 10.
Psychosomatic Theory of Thyrotoxicosis. G. C. Ham, F. Alexander and H. T. Carmichael.—p. 18.
Life Situations, Emotions, and Exercise Tolerance. C. H. Duncan, I. P. Stevenson and H. G. Wolff.—p. 36.
Psychodynamics of Depression from Etiologic Point of View. S. Rado. —p. 51.
Prolonged Sneezing: Case Report. N. Murray and J. Bierer.—p. 56.

South Dakota Journal of Medicine, Sioux Falls

4:1-38 (Jan.) 1951

Treatment of Acute Allergy Met in General Practice. F. W. Wittich. —p. 1.
Primary Carcinoma of Lung. C. S. Larson.—p. 11.
Hospital Service vs. Medical Practice. L. J. Pankow.—p. 18.

4:39-58 (Feb.) 1951

Severe Fractures About Ankle. R. Householder.—p. 39.
Diagnostic Significance of Some Ocular Complaints. P. J. Leinfelder. —p. 43.

FOREIGN

Acta Medica Scandinavica, Stockholm

139:79-166 (Jan. 31) 1951

Phosphatase Studies on Case of Prostatic Carcinoma with Metastases. S. E. Björkman.—p. 79.
*Protrusion of Cervical Intervertebral Disks with Lesion of Spinal Cord. R. Müller.—p. 85.
Protrusion of Thoracic Intervertebral Disks with Compression of Spinal Cord. R. Müller.—p. 99.
*Combined Intracavitary and Oral Therapy with Thiosemicarbazone (Conteben TB I). H. Malluche.—p. 105.
Studies on Effect of Anti Bone Marrow Serum. B. Björklund and L. Hellström.—p. 122.
Diabetic Renal Disease. C. J. Bjerkelund.—p. 133.
Eosinophilic Leukemia Infiltrating Gasserian Ganglion. N. B. Nordlander. —p. 146.
Correlation Between State of Cerebrospinal Fluid and Clinical Picture in Disseminated Sclerosis. R. Müller.—p. 153.

Protrusion of Cervical Intervertebral Disks.—Observations are reported on 13 patients with protruded cervical intervertebral disk, with symptoms of medullary lesion. The sex distribution in the material—11 men and two women—shows that males decidedly predominate, which corresponds to reports in the literature. Only two patients were aware of any trauma. Five patients, before the appearance of symptoms of medullary lesion, had at some period had signs of cervical radiculopathy, in two cases the interval being about 20 years. The symptoms had lasted for an average of three years. The clinical picture was extremely variable and easily confused with that of tumors and degenerative disease of the spinal cord. In all cases except one there was bilateral damage to the spinal cord. Segmental symptoms, arising from root compression, were observed in seven cases. Plain roentgenograms of the cervical spine showed in eight cases extensive, and in four cases more limited, spondylosis deformans. Only in one case was the roentgenogram normal. Myelography was carried out by the inflation of air into the cisterna magna. In all cases the subarachnoid space was narrowed and distorted by an anterior protrusion, which reached the spinal cord. There was no obstruction to the passage of the air into the thoracic subarachnoid space. Only in three cases was the protrusion limited to one intervertebral disk. In the remaining case it was more extensive. Twelve patients were operated on. The results were not very satisfactory, since in the majority of cases irreversible injury of the spinal cord had already developed as well as changes of the spondylosis deformans type, which did not permit a radical intervention.

Intracavernous Administration of Amithiozone.—One hundred patients with tuberculous pulmonary cavities were treated with combined suction drainage, daily intracavitary instillation of 0.1 gm. of amithiozone (thiosemicarbazone, TB-1) in a 20% suspension of glycerin, and amithiozone, 0.05 to 0.1 gm. daily by mouth. To prevent infection of the drainage canal, 10,000 or 20,000 units of penicillin were injected into the cavity every other day. If there were febrile reactions during this treatment streptomycin was given for one or two weeks, 0.25 gm. daily into the cavity and from 0.25 to 0.75 gm. intramuscularly. Prolonged treatment with streptomycin was avoided so that streptomycin-resistant tubercle bacilli would not develop. Suction drainage was usually done during the day and the intracavitary chemotherapy at night. Tubercle bacilli were usually eradicated in about three weeks, and no resistance to amithiozone developed. It proved possible to close permanently even comparatively large cavities. Patients with serious exudative tuberculous processes or with multiple cavities can also be treated with intracavernous administration of amithiozone. Before the trocar and catheter are introduced for suction drainage, it is necessary to ascertain that the pleural layers adhere to one another. If there is no adherence, it can be induced by the injection of blood, 60% dextrose or kaolin. The period over which drainage has to be continued ranges from several weeks to several months. In patients with large cavities supplementary collapse therapy may be necessary.

An asterisk (*) before a title indicates that the article is abstracted. Single case reports and trials of new drugs are usually omitted.

Canadian Medical Association Journal, Montreal

64:95-186 (Feb.) 1951

*Sudden Death from Asthma. C. H. A. Walton, D. W. Penner and J. C. Wilt.—p. 95.
Oesophageal Foreign Bodies. G. Boyd.—p. 102.
The Painful Back. A. W. Bagnall.—p. 107.
Tumours of Brain, Occipital Lobe: Their Signs and Symptoms. D. Parkinson and W. M. Craig.—p. 111.
Maintenance and Improvement of Hearing in Radical Mastoid Surgery. J. A. Sullivan.—p. 113.
Placental Anomalies. A. A. Earn.—p. 118.
Tridione and Paradione Sensitivity. R. R. Forsey and R. W. Black. —p. 120.
Indians and Tuberculosis of Skin and Bones. E. Gaumond and R. Therrien.—p. 122.
Persistent Vomiting Due to Cardio-Oesophageal Relaxation in Infancy. P. H. Spohn and C. G. Campbell.—p. 126.
Oesophago-Dermato-Oesophagoplasty for Congenital Oesophageal Atresia. D. E. Ross, H. Baxter and H. E. McHugh.—p. 128.
Method of Selection and Treatment of Group of Patients Suffering from Atypical Facial and Head Pain. H. T. R. Mount.—p. 131.
Traumatic Rupture of Lower Trachea with Stenosis. G. A. Henry. —p. 134.
Neuropsychiatric Sequelae of Cardiac Arrest During Spinal Anesthesia: One Year Follow-Up of Case. V. A. Kral.—p. 138.
Broncholithiasis and Broncho-Oesophageal Fistula. H. M. Kidd and E. Christopherson.—p. 142.
Acromegaly and Diabetes. J. H. Darragh and W. M. Shaw.—p. 146.
Protein Feeding and Blood Sugar Levels in Diabetes. E. R. Gubbay. —p. 150.
*Myasthenia Gravis of the Newborn. A. K. Geddes and H. M. Kidd. —p. 152.

Sudden Death in Asthma.—Asthma is generally regarded as a benign disease incapable of causing death. The authors report on 13 patients with bronchial asthma who died suddenly during an attack and in whom there was demonstrated at autopsy sufficiently widespread bronchial obstruction to account for death. The ages of the patients varied from 14 months to 62 years. A constant pathological picture was seen in all. The smaller and medium sized bronchi were occluded with thick tenacious mucus; the walls of the bronchi were edematous and infiltrated with eosinophils and the basement membrane was hyalinized. The lungs were emphysematous and distended. Some degree of right ventricular hypertrophy was present in six cases. Heavy sedation preceded death in nine of the 13 cases, and the authors conclude that morphine, meperidine (demerol®) hydrochloride, large doses of barbiturates, intravenous anesthetics and curare are dangerous in an asthmatic. They also regard aspirin sensitivity as a bad prognostic sign, since three of their 13 patients manifested it.

Myasthenia Gravis of the Newborn.—Myasthenia gravis has been considered rare below the age of 10, and until recently its occurrence in infants has passed unrecognized. The authors report the occurrence of transitory myasthenic symptoms with eventual complete recovery in three infants born of myasthenic mothers. From a review of the literature they conclude that neonatal myasthenia can be divided into two definite groups: true persistent congenital myasthenia gravis, so far reported only in children of nonmyasthenic mothers, and a transient myasthenia syndrome of the newborn, occurring in the infants of women with or without thymectomy, who have suffered from myasthenia gravis during their pregnancies. Before the advent of neostigmine (prostigmin®) bromide it was customary to recommend therapeutic abortion to patients with myasthenia gravis. Now that more of such pregnancies are allowed to continue to term it is probable that cases of myasthenia syndrome of the newborn will be observed more frequently. The pathogenesis of the condition is discussed.

Münchener medizinische Wochenschrift, Munich

93:153-208 (Jan. 26) 1951. **Partial Index**

Surgical Treatment of Congenital Malformations of the Heart and of the Large Vessels. G. Kuetgens.—p. 157.
*Life at Low Body Temperature. W. Lutz and R. von Werz.—p. 161.
*Temporal Arteritis: Two Cases. H. Weil.—p. 167.
*Is Vaccination with BCG Entirely Harmless? W. Beyer.—p. 171.

Life at Low Body Temperature.—The cause of death from exposure to cold in warm-blooded animals must be searched for in those functions in which these animals differ from cold-blooded animals; namely, in oxygen consumption and oxygen

supply. The oxygen consumption of cold-blooded animals is largely dependent on the surrounding temperature; if it declines, the metabolic rate declines with it. The cold-blooded animal makes no effort to increase its body temperature by increasing the metabolism. The second difference is in the hemoglobin, the oxygen vehicle. This functions satisfactorily only when its affinity for oxygen is optimal, for, if this affinity is too small, oxygen will not be taken up by the lung, and, if it is too large, oxygen will not be given off to the tissues. This optimal affinity is dependent on the temperature. The hemoglobin of cold-blooded species not only functions at lower temperatures but is adequate over a larger range of temperatures in comparison to warm-blooded species, whose hemoglobin requires a constant temperature. The authors see in the species specificity of the hemoglobin the essential cause of the disturbances that develop when a warm-blooded animal is exposed to cold. The oxygen pressure of the blood decreases as cooling becomes more intense and prolonged; that is, death from exposure to cold is the result of oxygen deficiency. Experiments proved that the life of animals exposed to prolonged cooling could be prolonged by oxygen given under pressure. On the basis of this and other observations the authors make the following suggestions for the resuscitation of persons exposed to excessive or prolonged cold: 1. If the body temperature is lowered, the body should be warmed in a bath at 40 C. (104 F.). 2. If the cooling has depressed the respiration, oxygen should be given (if necessary inflation of the rigid thorax by means of a respiratory mask). This should be done even if there is apparent respiratory arrest. 3. Antishock therapy should be given to prevent later death.

Temporal Arteritis.—Two cases of temporal arteritis are reported. The first was that of a man aged 72 who complained of a persistent sensation of formication in the temporal region and also of tearing and piercing headaches, which were severest when he was reclining and were especially intense in the evening and during the night, often interfering with sleep. Examination revealed bilateral thickening and hardening of the temporal arteries and its branches and bluish red discoloration of the overlying skin. Histologic examination of a resected piece of the right temporal artery revealed that the arterial lumen was narrowed to a small slit. Next to the endothelial lining was a layer of fibrous connective tissue; beyond that there was a wide zone of granulation tissue, which consisted chiefly of epitheloid cells, interspersed with multinuclear giant cells and with remnants of the elastica interna, the other elastic fibers having been destroyed. The granulation tissue also contained numerous lymphoid cells and occasional granulocytes. The muscularis was narrow and showed fibrosis. The headaches subsided following resection of the artery, and the patient's general condition improved in response to treatment with iron, arsenic and a hydrochloric acid-pepsin mixture. In the second patient the skin covering the main branches of the temporal artery was reddish but the arteries did not stand out like cords above the level of the skin as in the other patient. Palpation revealed, however, cordlike hardening of the arteries. Resection of a piece of the temporal artery was followed by disappearance of the severe headaches. The author compares the aspects of these two cases with those of others reported in the literature and stresses that severe headaches are usually the most significant symptom.

Is Vaccination with BCG Entirely Harmless?—In a boy aged 10 a tuberculous abscess developed at the site of vaccination with BCG and the axillary lymph nodes of the same side of the body became swollen and had to be removed. This was the only case in 3,000 vaccinations with BCG in which this complication developed. The author concludes that the tubercle bacilli in BCG may, under certain conditions, such as in the presence of lowered resistance, elicit a tuberculous tissue infection.

Puerto Rico J. Pub. Health & Trop. Med., San Juan

26:1-100 (Sept.) 1950. **Partial Index**

Clinical Development of Yaws in Baixada Fluminense, State of Rio de Janeiro, Brazil. F. Nery Guimarães.—p. 1.
Studies on Chyluric Urines. C. F. Asenjo, J. E. Colón and F. Hernández-Morales.—p. 55.

Revista Chilena de Pediatría, Santiago

21:535-580 (Dec.) 1950. **Partial Index**

*Chloramphenicol in the Treatment of Children with Typhoid Fever. J. Meneghello, O. Undurraga and A. Raimann.—p. 535.
Protein Content of the Blood in Prematurely Born Children: Study of 109 Cases. O. Correa B. and H. del Pozo.—p. 544.

Chloramphenicol in Children with Typhoid Fever.—Sixty-one children with typhoid, most of whom were over 6 years old, were treated with chloramphenicol. In most of them the clinical picture was moderately severe and the diagnosis was confirmed by the isolation of Eberthella typhosa or by a positive reaction to the agglutination test. In 41 of the patients a two hour schedule, in 10 cases a four hour schedule and in 10 a 12 hour schedule of treatment was employed. As soon as the temperature became normal the dose was halved. The total dose averaged about 22 Gm., and the duration of treatment was 12½ days on the average. If treatment is continued for more than 12 days, the incidence of relapse is low. Of 13 children whose stools were cultured for several months after treatment, five showed positive cultures. Results of the agglutination tests were inconsistent. Four children died as a result of complications and one as the result of typhoid. Chloramphenicol does not prevent the complications usually caused by typhoid, and for this reason dietetic and general measures should be strictly enforced. The authors believe that the 12 hour schedule of treatment with chloramphenicol should be continued for at least 14 days.

Revista Clínica Española, Madrid

39:233-286 (Nov. 30) 1950. **Partial Index**

*Treatment of Collagen Diseases with Nitrogen Mustards. Treatment of Asthma. C. Jiménez Díaz, J. Perianes, A. Merchante and others.—p. 239.

Nitrogen Mustard in Asthma.—Nitrogen Mustard was administered to eight patients with acute bronchial asthma of long duration. The drug was administered by intramuscular injection in doses of 5 mg. every other day for a total of two or three injections. The treatment resulted in complete disappearance of asthma from the first injection in seven cases and slight improvement after the third and last injection in one case. A second and, in some cases, a third injection was given to maintain good results. Three months after discontinuation of the treatment cure of asthma persists in five patients. During this period the disease recurred in an attenuated form in the other two patients. According to the authors, asthma is one of the collagen diseases that are due to an abnormal organic reaction, during which incomplete antibodies are formed. These antibodies are incapable of producing immunity. Nitrogen mustard controls this abnormal action and elicits a normal reaction, with the production of complete antibodies, which can produce immunity. The normal reaction results in control of local and general eosinophilia, of lymphocytosis and of the histologic local lesions caused by dysfunction, if they are still in the reversible stage.

Rev. Gynec. e Obstet., Rio de Janeiro

45:3-60 (Jan.) 1951. **Partial Index**

*Endometriosis. N. Arenas and A. Foix.—p. 4.

Endometriosis.—Of 3,087 women with gynecologic diseases observed by the authors in Buenos Aires, 34 had symptoms suggestive of endometriosis. The predominant symptom in all cases was intramenstrual menalgia of progressive acuteness, often associated with frequency of urination, dysuria, rectal tenesmus and pain in the sacrum and bladder. Other signs of diagnostic value were painful uterine retroflexion and the presence of a tumor of the uterus or of tumoral nodules in the adnexa as found by palpation. As a rule, there were no signs of septic and gonococcic infection. Three patients received medical treatment, while the remaining 31 had a conservative operation. A macroscopic diagnosis of endometriosis was made in all patients in the latter group. Microscopic examinations of the removed tissues were made in 25 cases. The results confirmed the surgical diagnosis in 19 cases. Endometriosis was found in the uterus in seven cases, in the fallopian tubes in one case, in the navel in one case and in the ovaries in 10 cases. According to the authors,

endometriosis is frequently associated with myoma of the uterus, blastoma of the ovaries and cancer of the uterine neck. Various treatments are (1) medical treatment, consisting of testosterone and sedatives when the symptoms are mild and the patients are in or near the menopausal age, (2) conservative surgery (with conservation of a piece of the ovaries and sufficient functional endometrium) in women in the reproductive age, (3) castration in the presence of bilateral extensive involvement of the ovaries, together with myoma of the uterus and strong adhesions fixing the uterus and (4) roentgen therapy for acute recurrences after conservative surgical treatment as well as in presence of contraindications to or refusal of surgical treatment.

Revista Médica de Chile, Santiago

78:777-838 (Dec.) 1950. **Partial Index**

*Three Years of Experience with Anticoagulant Treatment. R. Armas Cruz, G. Lobo Parga and M. Davila.—p. 777.

Treatment with Anticoagulant Substances.—During the last three years the authors have administered anticoagulant substances to 318 patients of either sex, who were between the ages of 41 and 60. These patients have been observed for six months to three years. Treatment with bishydroxycoumarin (dicumarol®) alone or combined with heparin was given in the usual manner with good results in the following conditions: (1) myocardial infarction, (2) venous thrombosis without pulmonary embolism, and (3) pulmonary embolism without cardiac insufficiency. It was also successful in preventing thromboembolism. The results of the treatment were poor in cases of typical anginal pain, in arterial embolism and arterial thrombosis (including cerebral thrombosis). In cases of pulmonary embolism with cardiac insufficiency and phlebothrombosis the treatment failed. In these cases, however, anticoagulant treatment seems more promising when combined with ligation of the given vein.

Semaine des Hôpitaux de Paris

27:331-362 (Jan. 30) 1951

*Paraaminosalicylic Acid in Treatment of Primary Infection of Tuberculosis in Young Children. E. Lesné, L. H. Lafay-Coletsos and C. Lefrançois.—p. 331.

Causes of Eczema. E. Daubresse.—p. 336.

Diagnosis of Brucellosis with Aid of Bacteriotropic Index. G. Renoux and G. Simonnet.—p. 341.

*Pathological Manifestations in Lung and Mediastinal Lymph Nodes in Persons Vaccinated with BCG. J. Le Melletier and H. Cassar.—p. 344.

Paraaminosalicylic Acid in Tuberculosis of Children.—Twenty-eight children between the ages of 2 and 6 years with primary tuberculous infection were treated with pellets of paraaminosalicylic acid or sodium salt of paraaminosalicylic acid for three to four months. The daily dose varied from 0.60 to 0.75 Gm. per kilogram of body weight. Roentgenologic and clinical results were highly satisfactory. The clinical symptoms, particularly fever, frequently subsided within the first 15 days of treatment. The general condition was improved within the following weeks. There was significant roentgenologic improvement, usually beginning during the first month of treatment. After three to four months of treatment the roentgenologic clearing obtained was comparable to that usually observed in children after 18 months of simple dietary and hygienic management. Treatment with paraaminosalicylic acid was well tolerated. The only untoward reactions consisted of cutaneous manifestations of intolerance, which disappeared rapidly after treatment was discontinued. Treatment with the sodium salt of paraaminosalicylic acid consequently seems to exert a curative effect on the manifestations of primary and secondary tuberculosis in children. Furthermore, it seems to shorten the duration of preventive treatment in children with primary infection involving the pulmonary lymph nodes. Treatment with paraaminosalicylic acid is a valuable adjunct to dietary and hygienic management and may be effective in the occasionally severe forms of primary infection in young children, the spontaneous regression of which is slow and frequently interrupted by acute manifestations.

Pathological Manifestations in Persons Vaccinated with BCG.—The occurrence of a clinical or roentgenologic abnormality of the lung, the mediastinal lymph nodes or the pleura in a person vaccinated with BCG requires careful investigation. Defective roentgenographic technique is responsible for a certain number of abnormal thoracic pictures observed under these conditions. Only strictly frontal pictures taken on inspiration make possible a correct evaluation of the mediastinum, hili and parenchyma. After a roentgenographic error has been excluded, a nontuberculous disease may be taken into consideratioin. In the majority of cases, however, a natural infection with a virulent tubercle bacillus has occurred in a contaminated environment. Careful investigation in these latter cases will frequently prove that the person with the abnormal condition was not vaccinated effectively at the time of the virulent contamination, that vaccination was not followed by a change in reaction to the tuberculin test from negative to positive, that too much time has elapsed since vaccination, that vaccination was administered during the preallergic phase or that an early virulent superinfection occurred during the vaccinal incubation period. A tuberculous lesion observed early after vaccination is only rarely caused by a virulent superinfection in an effectively vaccinated person in whom the reaction to the tuberculin test changed from negative to positive after the vaccination and before the natural infection. Statistics show that BCG vaccination is of definite value in preventing primary infection of tuberculosis and its immediate sequelae, miliary tuberculosis and meningitis. But there is no proof that it prevents the occurrence of pulmonary tuberculosis at a much later date. BCG vaccination may be responsible for mediastinal adenopathies in exceptional cases, two of which are reported by the authors. The condition is benign, and its diagnosis may be considered only in persons who have been strictly removed from any contact with tuberculous patients. BCG vaccination does not generally have any undesirable effects in persons with a positive reaction to tuberculin and in patients with pulmonary tuberculosis, but occasionally it may produce perifocal reactions. These reactions might also occur when vaccination is administered during the preallergic phase. It is suggested that intrathoracic adenopathy due to BCG may be favored by a preceding natural formation of tubercles or by an early virulent superinfection. In reality, the risks associated with BCG vaccination are small when compared with other methods of vaccination, but the efficacy of this vaccination is limited, and it should never be considered as a substitute for the classical methods of antituberculous prophylaxis.

Settimana Medica, Florence

38:521-550 (Nov. 15) 1950. **Partial Index**

Epidemiological and Clinical Observations on a New Outbreak of Salmonellosis in the Province of Florence Due to Eating Ice Cream. G. Biffi-Gentili and G. Abbozzo.—p. 529.

Urinary Elimination of 17-Ketosteroids in Women with Hypertrichosis, Before and After Administration of Folliculin. N. Di Ferrante.—p. 535.

*Aerosol Treatment of Dyspnea in the Cardiopath: Broncho-Dilating Aerosol. R. Monfardini and G. Vallecorsi.—p. 543.

Aerosol Treatment of Dyspnea in the Cardiac Patient.—Monfardini and Vallecorsi administered bronchodilating aerosols of epinephrine and theophylline substances, alone or in combination, to 22 patients with dyspnea of cardiac origin. Dyspnea was of a different type and acuteness as it complicated different heart diseases in various stages. The aerosols were given through the oral dispenser. A 2 per cent commercial epinephrine solution (sindreco)™ was inhaled for five to seven minutes for a total of five applications, and a commercial theophylline solution (tefamin) was inhaled for 10 or 15 minutes up to a total of 15 applications. Aerosol bronchodilating treatment gave better results than parenteral administration of the same substances to the aforementioned patients. The epinephrine aerosols promptly controlled the acute crises of dyspnea in patients with either left ventricular insufficiency or with pulmonary heart disease (cor pulmonale) resulting from bronchial asthma of long duration, but they had no effect on continuous dyspnea in patients with total cardiac insufficiency. This type of dyspnea responds well to theophylline aerosols. The tolerance of the patients to the inhalation of these aerosols was good. The authors believe that bronchodilating epinephrine aerosols control bronchial spasm as well as blood stagnation in the pulmonary vessels and that they stimulate general circulation. Theophylline aerosols control bronchial spasm and stimulate central nervous reflexes, through which respiration and cardiocirculatory functions improve.

South African Medical Journal, Cape Town

24:1081-1108 (Dec. 30) 1950. **Partial Index**

Electrokymography: Preliminary Report. R. J. Tahan and S. F. Oosthuizen.—p. 1081.
*Retrolental Fibroplasia: Report of Two South African Cases and Brief Review of Literature. H. Kaye and A. M. Rudolph.—p. 1089.
Production of Protective Antibody in Human Beings Immunized with Typhoid Endotoxoid. J. H. Mason and M. Robinson.—p. 1096.

Retrolental Fibroplasia.—Kaye and Rudolph present the histories of two prematurely born infants who had bilateral retrolental fibroplasia. They point out that confusion exists about the differentiation between the true bilateral developmental type (which occurs only in premature infants) and the unilateral type (found in full term infants). The unilateral type is the one usually referred to as a pseudoglioma, which indicates a white mass behind the lens and usually results from a chronic ocular infection, such as metastatic ophthalmitis. The two cases described here were of the true developmental type, which is characterized by a gray pupillary reflex, a retrolental vascular membrane, microphthalmos, shallow anterior chamber with anterior synechiae, remains of the anterior pupillary membrane, spheroidal lens and searching nystagmus. The incidence of this condition has been highest in some of the larger American cities. The cause has not been definitely established, but the authors mention various etiologic theories, pointing out that the modern tendency to give high doses of vitamin A and D to infants and the resulting low vitamin E levels may play a part. Treatment is rather unsatisfactory, but it is suggested that vitamin E be administered to premature infants. Deep roentgen therapy to the back of the globes might devascularize a vascular membrane and retard or halt the progress of the fibroplasia. The total dose suggested is about 400 to 1,000 r.

Strahlentherapie, Berlin

83:325-564 (No. 3) 1950. **Partial Index**

Irradiation in Operable Carcinoma of Breast. L. Diethelm.—p. 327.
*Treatment of Bone Metastases in Carcinoma of Breast. E. Pulvermacher.—p. 339.
Technique of Irradiation in Cancer of Breast. R. Bauer.—p. 401.
Significance, Possibilities and Results of Cytologic Diagnosis in Cancer of Lungs. T. Hornykiewytsch and W. Lorenz.—p. 441.
Application of Cytologic Diagnosis in Gynecologic Cancer. H.-K. Zinser.—p. 465.
Chemoprophylaxis in Radium Therapy of Cervical Carcinoma: Pathologic and Clinical Aspects. H. Muth.—p. 493.
Age Factor in Prognosis of Carcinoma of Female Genitalia. G. Schömig.—p. 499.
Studies on Biologic Effect of Ultrasonics on Living Cell: II. Reaction of the Female Genital Apparatus of White Mouse to Ultrasonic Treatment. H. Brettschneider.—p. 517.
Impairment in Fertility Following Application of Ultrasonics to the Female Genitalia. W. H. Thiele.—p. 531.

Bone Metastases from Mammary Carcinoma.—Pulvermacher observed 30 women who had cancer of the breast and bone metastases. The metastases, which were usually multiple, were found only in areas where red marrow exists. The majority of metastases developed during the first two years after the removal of the primary tumor. In women of menopausal age the interval was usually shorter (about 20 months) than in women beyond the menopausal age (28.8 months). Intensive irradiation with doses of 3,000 to 4,000 r is necessary for effective treatment. One of the first and most gratifying effects of roentgen irradiation is the analgesic effect on the bone metastases. A remarkable regeneration of destroyed bone regions resulted in many cases, in a few cases the pathological changes completely disappeared, in other sites the irradiated regions showed sclerotic density and in still others the bone structure assumed a spotted, cloudy appearance. Spontaneous fractures healed, but where bone destruction had led to deformity, this was not counteracted by irradiation. Irradiated vertebrae frequently contracted, assumed a saddle or wedge shape or fused with adjoining ones. Although the bone metastases responded favorably, the appearance of visceral metastases and increasing cachexia often reduced the seemingly lengthened life expectancy. Prolonged periods of cure were rare. Reports indicate that the survival after the appearance of bone metastases averages about five months without treatment. In the patients receiving irradiation it was 15.5 months. Medication with male sex hormones, to counteract the stimulating effect of ovarian hormones, and/or castration may increase the favorable effect of irradiation on bone metastases.

Trans. Royal Soc. Trop. Med. and Hyg., London

44:237-354 (Dec.) 1950. **Partial Index**

Tropical Pulmonary Eosinophilia. J. D. Ball and R. Treu.—p. 237.
Critical Review of Present Position of Sulphone Therapy in Leprosy. R. G. Cochrane.—p. 259.
Filariasis in Melanesia: Observations at Rabaul Relating to Incidence and Vectors. T. C. Backhouse and G. A. M. Heydon.—p. 291.
Oral Aureomycin in Treatment of Tropical Ulcers and Cancrum Oris. O. Ampofo and G. M. Findlay.—p. 307.
*Treatment of Yaws by Aureomycin. O. Ampofo and G. M. Findlay.—p. 311.
*Chloramphenicol in Treatment of Yaws and Tropical Ulcer. O. Ampofo and G. M. Findlay.—p. 315.
Lathyrism Syndrome. C. Gopalan.—p. 333.

Treatment of Yaws by Aureomycin.—Five children, 3 to 8 years of age, with florid secondary yaws were treated with aureomycin hydrochloride. This was given in the form of capsules by mouth, 250 mg., three times daily for seven days. This dose cleared up the secondary lesions and prevented recurrence for at least six months. Aureomycin given by mouth proved also of value in two children, 8 and 10 years of age, respectively, with late secondary or early tertiary yaws. They were given 500 mg. three times daily for seven days. It appears that in late secondary and in tertiary yaws aureomycin in the dosage given is less spectacular in its action than in patients with a florid secondary skin eruption. Nevertheless, it is of significant value in healing chronic ulcers and in relieving the pain in yaws periostitis. The oral administration of aureomycin caused no toxic symptoms such as fever, headache, nausea, vomiting or skin eruptions. Aureomycin behaves in yaws much in the same way as does penicillin. It has the advantage over penicillin in that it is effective by mouth in comparatively small doses. In mass treatment this is obviously a great advantage, since besides the pain of daily intramuscular injections there is a great saving of labor, apparatus and time.

Chloramphenicol in Yaws and Tropical Ulcer.—In this report Ampofo and Findlay present evidence indicating that chloramphenicol shares with penicillin and aureomycin the power to heal rapidly the primary and secondary lesions of yaws and also to eliminate the bacterial flora from tropical (phagedenic) ulcers, which allows healing to take place. Like aureomycin, chloramphenicol has the advantage over penicillin that it can be given by mouth. From the small number of patients so far treated with aureomycin and chloramphenicol it is impossible to determine which of the two is the more effective, as both antibiotics are so excellent.

Tubercle, London

32:1-24 (Jan.) 1951

Tuberculous Glands in Axilla and Groin. E. Hinden, S. G. Nardell and S. Anabtawi.—p. 2.
Mass Radiography and Public. G. Z. Brett.—p. 6.
*Thiosemicarbazones in Treatment of Pulmonary Tuberculosis. R. Livingstone and E. W. Street.—p. 8.

Amithiozone in Pulmonary Tuberculosis.—The histories are given of 12 patients who were treated with amithiozone (thioparamizone). The tuberculosis was of relatively recent onset in three of the patients; five had a more chronic form of the disease, and two had endobronchial tuberculosis. All patients at first had one 50 mg. tablet daily for three days, two 50 mg. tablets daily for the next three days and four 50 mg. tablets daily thereafter. The tablets were given either one or two at a time after meals, and treatment was in most cases continuous for up to five months. Although no dramatic claims can be made for this drug there is evidence that it is of some value in the treatment of pulmonary tuberculosis. Its effects appear to be most satisfactory in exudative lesions, and little benefit, if any, was observed in the more chronic type of lesion. The mild gastrointestinal upsets, depression and subjective ocular symptoms all seem to be transitory phenomena, not due to overdosage but disappearing in the course of the first few weeks of treatment as the body becomes adapted to the drug. An advantage of this drug over other antituberculous agents now in common use is its ease of administration and the fact that there appears to be no contraindication to prolonged administration.

BOOK REVIEWS

Physical Examination in Health and Disease. By Rudolph H. Kampmeier, A.B., M.D., Associate Professor of Medicine, Vanderbilt University School of Medicine, Nashville, Tenn. Cloth. $8. Pp. 821, with 550 illustrations. F. A. Davis Company, Publishers, 1914-16 Cherry St., Philadelphia 3, 1950.

Despite the fact that there are several excellent American textbooks on physical diagnosis, the author, after 25 years of experience in teaching this subject, felt that there was a need for a new textbook incorporating certain features not found to a satisfactory degree in existing books. He lists these features in the preface, and an appraisal of his success in accomplishing his aims will serve to demonstrate most of the qualities of the volume.

Feeling that the second year medical student should expand rapidly his knowledge of medical terminology, Dr. Kampmeier has incorporated many different technical terms and synonyms to broaden the student's vocabulary. He has attempted also to give anatomic, physiologic, and pathologic reasons for those statements that appear to him to require explanation. He has, in general, accomplished these purposes well.

A decidedly advantageous feature of this book is the presentation of the physical diagnosis of each region of the body in two chapters, the first dealing exclusively with the normal findings and their variations, the second devoted to abnormal findings. This arrangement permits the student to study the normal without being enticed into considerations of the pathological. Persons concerned with the teaching of physical diagnosis are keenly aware of the tendency for second year medical students to be concerned with diseases and syndromes before they have mastered fully the normal and its variations.

The author has succeeded in his effort to introduce an ample number of illustrations into the text, and the quality of these illustrations is, as a whole, above reproach. The availability of numerous, good, interesting illustrations should make this book popular with students, who do not ordinarily see more than a fraction of the many abnormal conditions described in such a textbook in the customary one semester course in physical diagnosis. The use of many normal and abnormal roentgenograms serves to correlate roentgen and physical findings, and these illustrations are well reproduced for the most part.

The text is well written and has a greater degree of continuity than do some other books in the field. The relative absence of material on medical diagnosis permits a proportionately greater amount of space to be devoted to a consideration of the primary subject, which is consequently developed in sufficient detail without becoming tiresome. In some instances the chapters on abnormal findings include brief outlines of the abnormal pathological and physical findings in selected pathological states. These are sufficient for the purpose intended.

A definite defect exists. There is no integrated description of either a neurological or a vascular examination. For example, the examinations of the individual cranial nerves are scattered through the sections devoted to the head and neck, the eyes, the ears, and the nose and throat, and there is no separate section devoted to an examination of the cranial nerves per se. Although one may argue that such an examination rightfully belongs in the field of neurological diagnosis, it should be presented in an integrated manner, even in outline form, in a textbook of this sort. One who is particularly interested in the peripheral vascular system may insist that the examination of the peripheral vessels and the limbs for changes secondary to peripheral vascular disturbances be treated as a distinct discipline and not interspersed, inadequately in this instance, in the general examination of the limbs.

The format of the book is above reproach, the paper excellent, and the photographs superior. Especially notable is the absence of old photographs so commonly employed in edition after edition of textbooks of this sort. Combined with a good series of lectures and demonstrations, this book should serve its purpose admirably. Moreover, it makes interesting reading, even to one who has read many such textbooks, some of them a number of times.

Gastroscopy: The Endoscopic Study of Gastric Pathology. By Rudolf Schindler, M.D., F.A.C.P. Second edition. Cloth. $20. Pp. 433, with 376 illustrations. The University of Chicago Press, 5750 Ellis Ave., Chicago 37; Cambridge University Press, Bentley House, 200 Euston Rd., London, N.W.1, 1950.

The first edition of Schindler's "Gastroscopy" appeared in 1937. The advancement and popularization of the method of gastroscopy is responsible for the appearance of this edition. Comparison of the two reveals that most chapters have been entirely rewritten, a new one has been added and a great deal of new material incorporated. Many color pictures were replaced by new and better ones, and the total was increased from 96 to 120. Particularly interesting to the general practitioner should be the chapter dealing with the history of gastroscopy. The method had its origin with unsuccessful attempts of Kussmaul in 1868 and with the first more or less successful rigid gastroscope of Mikulicz in 1881. The progress has been marked by a number of innovations and improvements, so that now there is what appears to be a satisfactory flexible gastroscope introduced by the author in 1932. The present volume is based on experience with 1,300 gastroscopies performed with the rigid gastroscope and 6,000 gastroscopies performed with the flexible gastroscope. Comparative observations with the aid of radiologic studies, gross specimens and histologic studies have helped to establish the criteria for the interpretation of the gastroscopic pictures. There are chapters dealing with the anatomy of the parts concerned, the technic of the method, the danger. Particularly important are the chapters dealing with endoscopic studies of the gastric pathology and the chapter dealing with the malignant tumors. The volume is attractively printed and is profusely illustrated. An extensive bibliography serves to make this volume a complete textbook on the subject of gastroscopy.

Pneumoconiosis: Beryllium, Bauxite Fumes, Compensation. Sixth Saranac Symposium, 1947. Edited by Arthur J. Vorwald, M.D., Director of Trudeau Foundation and Saranac Laboratory, Saranac Lake, N.Y. With collaboration of Manfred Bowditch, A.B., Thomas M. Durkan, M.E., and Theodore C. Waters, L.L.B. Leroy U. Gardner memorial volume. Cloth. $7.50. Pp. 659, with 196 illustrations. Paul B. Hoeber, Inc. (Medical Book Department of Harper & Brothers), 49 E. 33rd St., New York 16, 1950.

This book presents the proceedings of a conference held at Saranac Lake in the fall of 1947 under the sponsorship of the Saranac Laboratory. The conference was held for the discussion of the problems relating to two new occupational diseases, one connected with beryllium workers and the other with workers exposed to bauxite fumes. In addition, there is discussion of the medicolegal aspects of workmen's compensation in connection with these disabling diseases. In the preface, regret is expressed about the delay of publication due to unforeseen difficulties. To offset the delay, bibliography on the subject matter is included up to Jan. 1, 1950.

The volume is divided into seven parts, five of which deal with the beryllium problem, one with the bauxite fume problem, and another with problems related to workmen's compensation. There are twenty-nine presentations on beryllium, three on bauxite fumes, and seven on compensation.

The history of the beryllium problem is set forth and the various known sources, processes, and occupations in which workers are exposed to beryllium are included, as well as the present and future uses of beryllium. The acute and chronic types of pulmonary disease and the lesions of the skin are described separately and in some detail by physicians who have had extensive clinical experience in dealing with these diseases. Part three is particularly commendable in that the first presen-

The reviews here published have been prepared by competent authorities and do not represent the opinions of any official bodies unless specifically stated.

tation combines the clinical and epidemiological aspects. This is followed by presentations of those aspects that deal with the roentgenological, physiological, pathological, differential clinical diagnosis, and postmortem observations. Part four deals with the studies related to biochemistry and toxicology, and the fifth part is concerned with the experimental aspects. The difficulty of reproduction of the disease in animals is discussed, as is also the need for development of methods for quantitative determination of beryllium in tissues. Considerable space is devoted to the discussion of the latent development of the disease after exposure to beryllium. Some question beryllium as the etiological agent; others believe there is no doubt about beryllium being the causative agent.

Whether the disease associated with beryllium exposure is local or constitutional as general intoxication is discussed, but the question remains unsettled.

The several papers and the discussions of them present the facts as they were known up to 1947, and indicate quite clearly what is not known and, therefore, what problems remain to be clarified by future observation and study.

Part six deals with the pulmonary diseases observed among workers exposed to bauxite fumes, stating the facts as they have been established and emphasizing the need for further studies to elucidate the exact etiology and pathogenesis of the disease.

Since the date of the conference, a lot of work has been done which has thrown light on some of the obscurities that existed in 1947. Although at the present time there remain many unanswered questions, intensive work is in progress.

The book is to be commended for the order and arrangement of the material presented, although objection is justified in the use of the term "pneumoconiosis" as a title, since this word leads to semantic confusion. It is important from a historical viewpoint, and it is of particular and peculiar importance in the fact that it is a memorial volume to Dr. Leroy U. Gardner, who had planned the conference prior to his death and who has contributed more to the knowledge of pulmonary disease related to occupation than anyone else in the United States.

Illegitimate Sonnets. By Merrill Moore. Cloth. $2.75. Pp. 125. Twayne Publishers, Inc., 42 Broadway, New York 4, 1950.

This is the author's sixth book of sonnets. While he has written other books of poetry, the sonnet has taken such deep root in his mind that he now can write one without stopping to count the lines. This book acquires the name illegimate, because the sonnets do not resemble either the 8-6 original form of Petrarch nor the 4-4-4-2 model of Shakespeare. The author experiments with the sonnet, changing his models continually, as if it were plastic. In this volume, 128 sonnets are directed to various human experiences that are off the beaten path. The sonnet about a coolie who never had a shirt is a favorite:

> His wishes took on a very concrete form:
> He said he wanted a U. S. Army shirt.
>
> Some men might want a ranch house or a farm,
> Some a gold mine full of rich paydirt,
> But all he wanted was a U. S. Army shirt.
>
> Who was he? He was a coolie I once knew
> In China. Once he helped me pull my jeep
> Out of a mudhole on a ruined road
> Somewhere on the outskirts of Nanking.
>
> It took us hours to dig and pull it out,
> But finally we did. I took off my shirt
> And gave it to him; he was happier
> Than Louis Sixteenth ever was as king.
>
> He told me he had never had a shirt.

Dr. Moore is a psychiatrist, a long distance swimmer, an authority on marine shells, and the father of a large family. His scientific reports in various medical journals, including THE JOURNAL, attest his broad interest in medicine. He has published studies on brain tumors, alcoholism, epilepsy, syphilis, subdural hemorrhage in psychotic patients, and other subjects. He served in the South Pacific Islands and in China during World War II and was awarded the Bronze Star and other medals.

Das autogene Training (konzentrative Selbstentspannung): Versuch einer klinisch-praktischen Darstellung. Von Prof. J. H. Schultz. Sixth edition. Cloth. 27 marks. Pp. 325, with 17 illustrations. Georg Thieme, Diemershaldenstrasse 47, (14a) Stuttgart O; Agents for U. S. A.: Grune & Stratton, Inc., 381 Fourth Ave., New York 16, 1950.

"Autogenic training" seems to be the author's phrase for voluntary, progressive relaxation, and the purpose of the book is to describe the technics and difficulties of the process, as well as to indicate its relation to suggestion, hypnotism, yoga, gymnastics and pedagogy. In the course of several editions, the book has achieved a scholarly completeness and polish that will impress pleasantly those who are in sympathy with the author's objectives. To the unsympathetic it must seem overdone, beginning with the pictures showing the reader how to sit and recline (pages 15, 17) and reaching a climax in the case history of an art critic who found that people paid more attention to him after he had developed the habit of relaxing carefully in front of each picture before announcing his verdict. Despite the air of precision, the book is not truly critical, and the frequently occurring expression *"Kontrollversuch"* unfortunately does not mean "controlled experiment." The style is exclamatory and affected, and on page 94, for example, the author concatenates participial phrases in a way that has been ridiculed justly since the days of Mark Twain. The book seems to be dedicated to the proposition that the tensions of the body are to be relieved not by satisfying its needs but by lying down somewhere and relaxing. It will impress some readers, in fact, as a *reductio ad absurdum* corroborating the editorial opinion of the *Saturday Evening Post* that the real need is for "a book of counterpropaganda under the title, Start Worrying or Stop Living!"

The Education of Nursing Technicians. By Mildred L. Montag, Ed.D., R.N., Assistant Professor of Nursing Education, Teachers College, Columbia University, New York. Foreword by R. Louise McManus, Ph.D., R.N., Professor of Nursing Education and Director, Division of Nursing Education, Teachers College, Columbia University, New York. Cloth. $2.50. Pp. 146. G. P. Putnam's Sons, 210 Madison Ave., New York 13, 1951.

This new plan of nursing education is somewhat unique and unusual. The author is well equipped to write on nursing education. The book probably will be classed as a general reference work. Inclined to be repetitious, it is well documented, and there are extensive bibliographies.

The present pattern of nursing education is carefully assessed. The criticisms are much the same as those presented by others who have made a study of nursing education in the United States.

Three types of nursing personnel are recommended—the trained practical nurse, the professional (collegiate) nurse, and the nurse technician. This is but a slight deviation from the present group of nurses. The nursing technician, as outlined in this book, actually takes the place of the present hospital diploma nurse and will be trained in a junior college. This suggestion will meet with a great deal of opposition. A proposed two year course will meet with the approval of many. The book probably will not influence nursing education to any great extent.

The Practice of Sanitation. By Edward S. Hopkins, Principal Associate Engineer, Bureau Water Supply, Baltimore, Maryland, and Francis B. Elder, Colonel, Medical Service Corps (Sanitary Engineering Section) USAR. Cloth. $7.50. Pp. 423, with 110 illustrations. Williams & Wilkins Company, Mount Royal and Guilford Aves., Baltimore 2, 1951.

Interesting and instructive information is presented in this volume, which gives detailed attention to the many aspects of environmental sanitation without being too technical for the enjoyment or edification of the average nonspecialist reader. As the foreword points out, this is an appropriate time to assemble and survey the many advances that have occurred within the last half century.

Sixteen chapters comprise the volume. After consideration of the fundamental concepts of sanitation, the principles of disinfection and the sanitary survey, the authors give detailed attention to food sanitation, milk, water supplies, sewage disposal, control of stream pollution, refuse disposal, ventilation, swimming pools and insect and rodent control. All the newer prac-

tices in these various areas are described and interpreted, and there is a special chapter on administration procedures. Urgent problems such as atmospheric pollution by smoke, dust and pollen are considered in a chapter on environmental sanitation, which treats also of housing, slum clearance, industrial sanitation, air transporation, camps and motor courts.

Many chapters close with a brief summary of the data presented, and in most instances there are extensive bibliographies after each chapter. It can be stated that the aim of the authors to provide a guide for the training of physicians, nurses, sanitarians and students in sanitary engineering has been attained. In addition, the volume should be of value to school administrators and teachers, health departments and all leaders in civic activities. Author and subject indexes are provided.

Pulmonary Ventilation and Its Physiological Regulation. By John S. Gray, M.D., Ph.D., Professor of Physiology, Northwestern University Medical School, Chicago. Publication number 63, American Lecture Series, monograph in American Lectures in Physiology, edited by Robert F. Pitts, M.D., Ph.D., Professor of Physiology and Biophysics, Cornell University Medical College, New York. Cloth. $2. Pp. 82, with 14 illustrations. Charles C Thomas, Publisher, 301-327 E. Lawrence Ave., Springfield, Ill.; Blackwell Scientific Publications, Ltd., 49 Broad St., Oxford, England; The Ryerson Press, 299 Queen St., W., Toronto 2B, 1950.

In this monograph the author explains and defends his quantitative theory as to the identity and relative importance of the variables that determine the frequency and depth of breathing in man. The theory is stated in general terms on pages 11 and 12. The three important variables are the tension of carbon dioxide, the tension of oxygen and the negative logarithm of the hydrogen ion concentration in the arterial blood. By assigning an appropriate weight to each of these three figures and then adding, one can obtain the figure for pulmonary ventilation (respiratory minute-volume). A closing section gives an illuminating discussion of the concept of sensitivity. This concept, as applied to the respiratory center, has often been invoked in previous attempts to make theories of respiration come out right; it tempts the physiologist much as "Kelly's constant" is said to tempt the engineer. The author neither accepts nor rejects this concept.

By way of negative criticism it must be said that the notation used in the equations is of a sort that irritates mathematicians and can drive a medical student to despair. Too many letters are used not as factors in a product but in abbreviations like VR. The symbol "p" sometimes means "the negative logarithm of the concentration expressed in equivalents per liter" as in "pH," but sometimes means "tension of a gas measured in millimeters of mercury" as in "pCO_2." There is also little justification for the use of subscripts on subscripts in situations as simple as that on page 36. A glance at the bibliography (pages 80 to 82) revealed eight errors in less than that many minutes.

This book can be recommended to physiologists and pharmacologists as a succinct discussion of a problem with which they have been occupied for a long time.

Check: Community Health Educator's Compendium of Knowledge. By Clair E. Turner, Ed.M., D.Sc., Dr.P.H., Assistant to President, National Foundation for Infantile Paralysis, Arlington, Mass. Cloth. $3. Pp. 266, with illustrations. C. V. Mosby Company, 3207 Washington Blvd., St. Louis 3, 1951.

The significance of the title is found in the organization of the book which is a check list. The basic principles of health education are discussed in check list form so that circumstances in a given community can be evaluated. In like manner established methods of working with people can be checked. The mediums of group communication such as writing, speech, television, radio, newspapers, pamphlets, books, visual aids and letters and questionnaires are enumerated also according to the check list principle. One extensive chapter shows how a given community carried through an educational program combined with action for the eradication of poison oak. This book should be of interest to physicians engaged in public health or health education projects or to the members of county medical society committees who may have occasion to evaluate health education programs current in their communities.

Parasitic Infections in Man. Edited by Harry Most. Symposium held at New York Academy of Medicine, March 15 and 16, 1949. Symposia of Section on Microbiology, New York Academy of Medicine, no. 4. Cloth. $4.50. Pp. 229, with illustrations. Columbia University Press, 2960 Broadway, New York 27, 1951.

The editor of this book is chairman of the section on microbiology. The symposium consists of a series of papers by 14 authorities, which are separated into chapters. These cover significant developments in the knowledge of the common parasitic diseases in man: malaria, blood flagellates, amebiasis, intestinal helminths and schistosomiasis. The introductory lecture emphasizes the economic and political aspects of human parasitism. Immunologic diagnosis and immunity to parasitic infections are separately discussed. Also of interest is the report of significant findings in the life cycle of malarial parasites. Evaluation of amebicides and the status of antimalarial drugs, which are presented, will be of special interest to physicians in both epidemic and endemic areas of these infections. Clinicians working in parasitology or in tropical medicine will find this book of value for a quick review of current developments and the direction of future investigations of the subject. The usefulness of the publication is increased by references at the end of each chapter. No general index is provided. The binding, paper and format are pleasing and designed for convenience.

Klinische Physiologie und Pathologie. Von Prof. Dr. Ferdinand Hoff, Vorstand der medizinischen Klinik der Städtischen Krankenanstalten Aachen. Cloth. 39 marks. Pp. 782, with 124 illustrations. Georg Thieme, Diemershaldenstrasse 47, (14a) Stuttgart O; agents for U. S. A.: Grune & Stratton, Inc., 381 Fourth Ave., New York 16, 1950.

This is a book of interpretations and attitudes, as distinguished from data and proofs, regarding the diseases of the human body. Beginning with two chapters on the general concept of disease and on the coordination of circulation, respiration and metabolism, the author takes up in turn the various systems of the body and explains how they are disturbed in disease. It is assumed that the reader starts with a thorough knowledge of physiology and pathology, so that it is sufficient to allude to things without defining them (e. g., the Rumpel-Leede test on page 279) or to define them (e. g., thrombasthenia) without proving that they exist. The style is self conscious and lofty, and there is much emphasis on the idea that all parts of the body are involved in every disturbance of its equilibrium. However, there is genuine scholarship behind this work; there is a good bibliography, and the illustrations are excellent.

Anatomy of the Nervous System. By Olof Larsell, M.A., Ph.D., Sc.D., Professor of Anatomy, University of Oregon Medical School, Portland. Introduction by A. T. Rasmussen, Ph.D. Second edition. Cloth. $9. Pp. 520, with 382 illustrations. Appleton-Century-Crofts, Inc., 35 W. 32nd St., New York 1, 1951.

This introductory textbook of neuroanatomy has undergone considerable reorganization and revision. The opening chapters present in some detail the gross anatomy, embryology and histology of the central nervous system and serve as a background for the subsequent description of the connections and relation of the functional pathways of the brain and spinal cord. The final chapter deals with the blood supply of the brain and spinal cord and the innervation of the meninges. The book contains numerous clearly labeled illustrations, and there is a selected list of references at the end of each chapter. The book presents a broad survey of the field of neurology and should be of value to students of biology, including medical students.

The Normal Encephalogram. By Leo M. Davidoff, M.D., Director of Neurological Surgery, Beth Israel Hospital, New York and Cornelius G. Dyke, M.D. Third edition by Leo M. Davidoff. Cloth. $6. Pp. 240, with 190 illustrations. Lea & Febiger, 600 S. Washington Sq., Philadelphia 6, 1951.

This book is and has been the standard work on pneumoencephalography since it first appeared. It is concisely and clearly written and is a thorough presentation of the subject. The illustrations are well chosen and clearly reproduced. There is a useful index. The sizable bibliography has not been brought up-to-date. It contains few references from the past decade.

Virus and Rickettsial Diseases. By S. P. Bedson, M.D., F.R.C.P., F.R.S., Professor of Bacteriology, London Hospital, London, A. W. Downie, D.Sc., M.D., Professor of Bacteriology, University of Liverpool, Liverpool, F. O. MacCallum, M.Sc., M.D., Director, Virus Laboratory, Central Public Health Laboratory, and C. H. Stuart-Harris, M.D., F.R.C.P., Professor of Medicine, University of Sheffield, Sheffield. Cloth. $4.50. Pp. 383, with 33 illustrations. Williams & Wilkins Company, Mount Royal and Guilford Aves., Baltimore 2, 1950.

Four of the 24 chapters of this manual deal with the general aspects of the viruses, such as their size, microscopy, culture, effect on cells, chemical composition, probable nature, immunology and natural history, as well as the epidemiology and therapy of viral diseases. The subsequent pages deal with viruses commonly infecting man. Each chapter consists of a brief introduction; taxonomic discussion, followed by the description of the biological and physical properties, viability and action of the virus; a presentation of the pathology, clinical features, diagnosis, epidemiology, treatment and control of the respective disease, and a list of references. The last two chapters deal with animal viruses affecting man and with bacteriophages. The appendix contains a tabulation of the methods of the laboratory diagnosis of viral diseases. Finally, an excellent index is added.

The greatest virtue of this book is that it presents much information in a brief, concise way. In spite of its brevity, the authors were able to find more space for problems which require detailed discussion, as, for example, the description of the difference between viral hepatitis and homologous serum jaundice. The information contained in this manual is up-to-date. One certainly appreciates the very careful presentation of such controversial topics like infectious mononucleosis and viral diarrhea. The style of the book is excellent. It has been carefully edited and printed.

The Burden of Diseases in the United States. By Alfred E. Cohn and Claire Lingg. Cloth. $10. Pp. 129, with 38 illustrations and 5 boxed charts. Oxford University Press, 114 Fifth Ave., New York 11, 1950.

This is an extensive analysis of mortality statistics and morbidity surveys in the United States. A large color chart also shows mortality rates by major causes of death in 42 foreign countries. The authors state their purpose as "scrutinizing critically the vast amount of statistical information that now lies frozen and uninterpreted in the articles and publications of census bureaus." The discussion is scholarly and stimulating. On the whole, the objective of the book has been achieved, and the volume will serve as an excellent reference for those interested in the existing data regarding mortality and morbidity from specific diseases. Specialists in each field probably will question some of the points made regarding the disease group of their special interests. However, the authors always manage to present some fresh viewpoint. An example is found on page 9: "We tend to advertise and to back specified diseases as if they were race horses, each special group of physicians and their lay supporters betting on his own particular horse. . . . . How special pleaders are to be managed is a question that needs most seriously to be canvassed. . . . . It is not too much to expect, we hope, that voluntary health agencies will co-operate, in candor, to serve the public rather than to serve their own vested interest." The book can be recommended particularly to those interested in public health and vital statistics.

Clinical Parasitology. By Charles Franklin Craig, M.D., M.A.(Hon.), Sc.D.(Hon.), and Ernest Carroll Faust, M.A., Ph.D., William Vincent Professor of Tropical Diseases and Hygiene and Head, Division of Parasitology, Department of Tropical Medicine and Public Health, Tulane University of Louisiana, New Orleans. With chapter on "Control of Medically Important Arthropods" by Albert Miller, B.S., M.S., Ph.D., Associate Professor of Parasitology (Medical Entomology) in Department of Tropical Medicine and Public Health, Tulane University of Louisiana, New Orleans. Fifth edition. Cloth. $12. Pp. 1032, with 332 illustrations. Lea & Febiger, 600 S. Washington Sq., Philadelphia 6, 1951.

The authoritative standing of this textbook on clinical parasitology is widely recognized. This edition lives up to its predecessors and includes advances in knowledge of the subject that have been made since the previous edition. Most of the chapters have been revised and new ones added to improve the text and to include new information. A question might be raised regarding the practicality of retaining the separate chapter on nonpathogenic amebas, which are considered significant only in the differential identification of Endameba histolytica. The authors are indebted to Dr. Albert Miller for a new chapter on the control of medically important arthropods, which includes valuable information on the use of insecticidal chemicals. There are some new illustrations, and several of the older ones have been revised.

The book retains the scheme of zoologic classification and the classical textbook style in presenting the information on specific parasitic diseases. It retains also the valuable technical section on the procedures for collection of the specimens required and laboratory methods for identification of human parasites and arthropods. The separate section of references to the literature is essential for students of the subject. The book provides both an author and a subject index. On page 1028, the latter lists trachoma as being on page 693, but no mention of that viral disease is found or should be found in a book on parasitology. This new edition is otherwise comparatively free from errors and will be welcomed alike by physicians, students and laboratory workers in parasitology.

Toxæmias of Pregnancy: Human and Veterinary. Editors: John Hammond, M.A., D.Sc., F.R.S., F. J. Browne, M.D., D.Sc., F.R.C.S., and G. E. W. Wolstenholme, O.B.E., M.B. Ciba Foundation symposium. Cloth. $4.50. Pp. 280, with 93 illustrations. The Blakiston Company (Division of Doubleday & Company, Inc), 1012 Walnut St., Philadelphia 5, 1950.

This monograph presents material read before a meeting of European and North American authorities. There are short presentations on the physiology of pregnancy, the pathologic lesions and changes occurring during various toxemias, and certain theories of etiology.

One of the most interesting etiological theories is the theory of Schneider. He postulates that certain thromboembolic phenomena and pathologic changes found in experimental animals after injection of thromboplastin resemble changes occurring in certain complications of pregnancy, including toxemia. Schneider stresses several possible portals of entry for thromboplastin into the maternal circulation from the conceptus. He suggests that the frequently seen, isolated, retroplacental hemorrhages may play a major role in the mobilization of thromboplastin into the maternal circulation in human toxemia.

Despite the variability inherent in a presentation by many authors, this book is a valuable monograph replete with excellent sources of bibliography.

Natural Childbirth: A Manual for Expectant Parents. By Frederick W. Goodrich, Jr. Cloth. $2.95. Pp. 176, with illustrations. Prentice-Hall, Inc., 70 Fifth Ave., New York 11, 1950.

Grantly Dick Read's theories form much of the background for this presentation. The advantages and disadvantages of "rooming-in" are also developed. "Natural childbirth" is a misnomer since it implies no interference with the natural course of labor. Actually, the author suggests pain relief and episiotomy in the conduct of labor during "natural childbirth." As an exposition on the proper course of prenatal care and preparation for childbirth for the laity, this is a well-developed, logical book couched in simple, understandable language. Certainly, the psychosomatic advantages of proper education and preparation of the mother for childbirth should not be overlooked by the profession. A relaxed, confident, understanding, cooperative patient makes the obstetrician's task easier and will tend to further reduce complicating factors of childbirth.

Official Methods of Analysis of the Association of Official Agricultural Chemists. Editorial Board: Henry A. Lepper, Chairman. Committee on Editing Methods of Analysis: H. J. Fisher (Chairman), and others. Seventh edition. Cloth. $10. Pp. 910, with 73 illustrations. Association of Official Agricultural Chemists, P. O. Box 540, Benjamin Franklin Station, Washington 4, D. C., 1950.

This is the latest edition of the methods recommended for "official" analyses of some drugs, most foods, common insecticides, some cosmetics and the chief vitamins. The methods were developed through an extensive program of cooperative testing and are practically foolproof. The chemists belonging to the association, i. e., those who developed the assay procedures, are those employed by city, state and federal departments of agriculture and agencies concerned with the enforcement of laws relating to foods, drugs, fertilizers, feeds, insecticides and fungicides. Eighty pages of tables in the back of the work make it self contained. There is an excellent index.

QUERIES AND MINOR NOTES

TREATMENT OF MYASTHENIA GRAVIS

To the Editor:—*A young patient with myasthenia gravis requires three injections of neostigmine daily. She does not respond to medication by mouth and cannot eat without having 1.0 cc. of 1:1,000 neostigmine 20 minutes to a half-hour before. The case has been properly worked up at one of the major centers and is apparently one of pure myasthenia gravis. Is there any further therapy? Is there any center or school performing research on this disease with whom I might communicate?*

M.D., Harrison, N. Y.

Answer.—Almost all patients with myasthenia gravis can be adequately maintained on oral medication with neostigmine bromide, provided the drug is given at appropriate intervals of time throughout the day and night. Injections of neostigmine methylsulfate in rare instances may be necessary to supplement the oral medication. They are usually used prior to the main meal of the day, if dysphagia is one of the principal symptoms, to augment the ingestion of neostigmine. In one series of over 300 patients with myasthenia, no case has been found in which oral medication was not useful and, indeed, the primary means of giving neostigmine. It is possible that a patient would not respond to medication by mouth if there were some fundamental difficulty in absorption, but an incidence has not been reported in the literature or met with clinically. The difficulty expressed in the query would seem to be due to a failure to adjust the patient to the proper dose at the appropriate interval of time. Ordinarily the effect of neostigmine when given by mouth wears off in about two hours, and further medication is needed. Schedules on a two hour basis are usually set up and changed from time to time until adequate maintenance is achieved. This requires a good deal of persistence on the part of both the patient and the physician and sometimes can be done only under hospital circumstances.

There are relatively few medical centers that have specialized in the investigation of myasthenia gravis. Work has been done, however, at the Johns Hopkins Hospital, the Mayo Clinic and the Neurological Institute in Montreal; the largest clinic has been established at the Massachusetts General Hospital in Boston, where research has been carried on since 1935 and more than 300 patients investigated.

ORTHOKINETICS

To the Editor:—*I would like information on orthokinetics which is being popularized by one Dr. Julius Fuchs in New York City. I have been unable to find anything in the literature regarding this new method of therapy in the treatment of hypertrophic osteoarthritis. I understand that it is a means of changing muscle function from one set of muscles to another in order to rest the affected joint.*

M.D., New York.

Answer.—More evidence than has been presented would be necessary before the procedure of orthokinetics could be considered seriously. The mechanisms described by the author are not presented clearly, and their value is debatable, to say the least. The mechanics as described by the author in his vague article published in English in 1946 cannot be accepted. It seems evident that it would not be possible in the majority of instances to obtain the mechanical substitutions which he described. Even if change of muscle function were possible by the method, this procedure could not be expected to be of any great value in the management of hypertrophic arthritis as it still would not rest the joint. It is known that surgical tendon transferral, whereby muscle function can be changed, usually has no appreciable effect on a hypertrophic joint. The procedure of orthokinetics requires much more study before it can be given any acceptance.

The answers here published have been prepared by competent authorities. They do not, however, represent the opinions of any official bodies unless specifically stated in the reply. Anonymous communications and queries on postal cards cannot be answered. Every letter must contain the writer's name and address, but these will be omitted on request.

COLOR-BLIND HUNTERS

To the Editor:—*Should hunting licenses be issued to color-blind persons? If not, what color test would be the best for general use? If licenses are issued indiscriminately, what colors or combination of colors should the hunter wear so that he would not be mistaken for game?*

M. M. Medvene, M.D., Reading, Pa.

Answer.—To refuse hunting licenses to color-blind persons would be an undeserved discrimination. There is no color or combination of colors that will do more than call attention by contrast when visibility and visual acuity permit. Color-blind persons distinguish difference in contrast and brightness that suffices for their lack of ability to name color and adequately answers their need for general living conditions.

The custom of using red as identification by a hunter has become well established in the minds of the people, as is the use of white canes by blind persons. The same identification could be established about any color that gives equal contrast with the usual surroundings. No color worn by a hunter will be more readily discerned or more quickly interpreted by the vast majority of hunters than the accustomed red. After all, the flag of identification must be set up for all hunters, irrespective of their color vision. The color-blind among hunters are no greater in proportion than in civil life. Their record of safety in traffic is no worse than the record of those who are not color blind. Factors other than inability to recognize the red cap of a hunter and the white tail of a deer are more responsible for unfortunate hunting accidents.

PREGNANCY TESTS AND DIURESIS IN PREGNANCY

To the Editor:—*What is the specificity of the neostigmine (prostigmine®) test in early pregnancy? What is the specificity of the test employing cyclogesterin® (estrogenic substances and progesterone) for the same purposes? Have mercurial diuretics been used to control edema and/or excessive weight gain in pregnancy when conventional measures fail?*

M.D., Pennsylvania.

Answer.—None of the various pregnancy tests that have been described has the degree of accuracy exhibited by the endocrine tests. The Aschheim-Zondek, the Friedman rabbit test or the several frog tests are accurate in 95 to 98 per cent of pregnant women checked within two weeks after the missed menstrual period. Results become positive in most instances within three weeks after fertilization or a week after the missed menstrual period. They all depend on the high concentration of urinary gonadotropin early in pregnancy.

Mercurial diuretics are not popular for promotion of diuresis in pregnancy. They may be used in pregnant patients who have good renal function, and, when administered in liberal amounts, they are effective. Disturbed water balance and the retention of fluids can be better managed by severe chloride restriction and administration of hypertonic dextrose solutions intravenously. Usually, 20 per cent concentrations are most effective, but small amounts of 30 per cent solution may be used in women who have cardiac failure or who develop oliguria.

DENTAL CARIES AND A MILK-FREE DIET

To the Editor:—*I would appreciate your opinion on the effect on a teen-ager's teeth of a completely milk-free diet.*

M.D., Pennsylvania.

Answer.—A milk-free diet should have no ill effect on dental caries, provided the diet is normal otherwise. The important dietary factor in relation to caries is fermentable sugar, which is known to promote dental decay. Experience in Italy (Schour, Isaac and Massler: Dental Caries Experience in Postwar Italy (1945): I. Prevalence in Various Age Groups, *J. A. D. A.* 35:1 [July] 1947) showed that the milk-free diet does not increase the caries attack rate.

INOPERABLE METASTATIC CANCER OF BREAST

To the Editor:—*Kindly supply data on the use of snake venom as well as mustard gas in the treatment of carcinoma. A woman in the early forties noted a small mass in one breast, and seven days later she was convalescing following its removal. Microscopic study disclosed its malignant character and now, nine months later, there are metastases, involving the bones in the lower limbs and the chest. Please cite pertinent bibliography and sources of supply for any recommended preparations of these two agents.*

L. K. Poyntz, M.D., Shiprock, N. Mex.

Answer.—Snake venom has largely disappeared from clinical use. There is no substantial evidence that it has any useful effect on cancer, although contradictory reports are contained in the literature and cobra venom has been used for the relief of pain with questionable results. A recent reference to the use of cobra venom in cancer may be found in an article by Hodes and Thorner (*Am. J. Roentgenol.* **45**:866, 1941).

Nitrogen mustard has been most effective in the treatment of the lymphomas and leukemias, but, occasionally, patients with breast cancer have shown transient regressions of the disease. These responses in breast cancer are unpredictable, and nitrogen mustard is not generally recommended (Karnofsky, D. A.: "Advances in Internal Medicine," New York, Interscience Publishers, 1950, vol. 4).

The available methods for treating inoperable metastatic carcinoma of the breast in premenopausal patients are castration, testosterone therapy and radiation therapy to selected areas. Castration is probably the treatment of choice. If this is not feasible, testosterone may be used; 100 mg. three times a week intramuscularly has been found in a large series of patients to produce objective improvement in about one-third and symptomatic improvement and relief of pain in about two thirds of the cases. The average period of improvement is about six months (Adair, F. E., and others: Estrogens and Androgens in Advanced Mammary Cancer, *J. A. M. A.* **140**:1193 [Aug. 13] 1949).

ASCARIASIS

To the Editor:—*I would appreciate information on the merits and disadvantages of chenopodium oil in the treatment of Ascaris infections in infants.*

William L. Bundy, M.D., North Wilkesboro, N. C.

Answer.—Chenopodium oil is the most potent anthelmintic agent for treatment of ascariasis. One administration of the oil usually removes 90 to 95 per cent of the parasites. It is bitter, has an unpleasant odor and is usually administered in combination with castor oil. The latter lessens absorption and toxicity but adds to the unpalatability of the mixture. Children, malnourished persons and the aged are susceptible to the toxic effects of the agent. The drug is cumulative, and its use should not be repeated for a week to 10 days after the first dose. In children the dose is 0.05 cc. per year of age, usually divided into two or three doses; it may be administered as drops of the mixture with castor oil. In infants the oil mixture is somewhat difficult to administer and may be accidentally inhaled into the lungs if the infant is resisting medication.

DIAPER RASH

To the Editor:—*Is there any internal treatment of ammonia dermatitis (diaper rash)?* *M.D., Pennsylvania.*

Answer.—Intertrigo, or diaper rash, is a red dermatitis due to irritation of the skin by sweat, urine, feces, irritating soaps and other local irritant agents. The ammoniacal diaper rash is not caused by the passage of ammonia in the urine but by the ammonia that is formed in the diaper, wet clothing or bed sheets by bacteria, which liberate it from the voided urine.

A highly concentrated urine may cause a scaldlike irritation of the tender skin of the young infant. In such instance one may increase the fluid intake by (*a*) urging the drinking of water and fruit juices between feedings, (*b*) restricting the foods that may cause acid urine, such as tomato, asparagus, rhubarb, prunes and prune juice, (*c*) the addition of a small amount of sodium citrate, 0.30 to 0.60 Gm. three times daily, to aid in neutralizing a very acid urine.

External aids in the treatment of diaper rash are the boiling and rinsing of diapers and, if necessary, the shirts, night clothes and sheets; this aids in eliminating the ammonia-producing bacteria. If the rash is severe, the diaper should be changed at each feeding or between feedings. Water-proof pants retain moisture and may cause further masceration of the skin; they also reduce the free circulation of air. Double diapering may help to absorb the moisture. A final rinsing of the diapers in a boric acid solution or in solutions containing methylbenzethonium chloride (diaparene chloride® or ammorid®) will act to prevent the occurrence of the ammonia-producing bacteria. Finally, exposure of the irritated skin to air or sunlight and the use of a protective covering, such as zinc oxide ointment or paste (without salicylic acid), may cure the condition and prevent its recurrence.

BILIARY CIRRHOSIS— A DIAGNOSTIC "CATCH-BASKET"

To the Editor:—*Is there any new treatment for biliary cirrhosis of the liver? What do you think of the use of sulfur? Bartholin at one time felt that continued use of proper doses of iodoform would effect a cure. Do you have any late information on its use?*

A. M. Marshall, M.D. Chandler, Okla.

Answer.—The answer to this question depends to a considerable extent on what is meant by biliary cirrhosis, a term which has long been a diagnostic "catch-basket." If the patient is suffering from the so-called cholangeolitic variety of cirrhosis as described by Watson and Hoffbauer, there is probably little that can be done to alter the course of the disease. If he is suffering from a residue of a chronic infectious hepatitis prolonged therapy with aureomycin might be worth a trial (Shaffer, J. M.; Bluemle, L. W. Jr.; Sborov, V. M., and Neefe, J. R.: *Am. J. M. Sc.* **220**:173 [Aug.] 1950). A third variety of liver disease sometimes confused with biliary cirrhosis, viz. chronic atrophy, is not amenable to treatment. It is, of course, assumed that there is no element of mechanical biliary obstruction in this case; certainly, if any doubt exists on this point, exploration of the extrahepatic biliary systems and a liver biopsy should be considered. There is no evidence to indicate that the use of sulfur or iodoform would have any effect on the course of chronic liver disease of any type, and most observers are pessimistic as to the effect of dietetic therapy, lipotropic agents and a high vitamin intake in the varieties of liver disease that would ordinarily be classed under the term biliary cirrhosis.

INFANTILE DIARRHEA

To the Editor:—*I am interested in the treatment of infantile diarrhea. In a lecture on administration of fluids to intubated patients, it was said that giving plain water would result in loss of electrolytes. Would 5 per cent dextrose in water given by mouth in cases of intubation or diarrhea result in a loss of electrolyte? Is rice water a carbohydrate solution? I have seen apple used in various forms. Is this for its pectin content?*

M.D., California.

Answer.—Large quantities of the secretions of the gastrointestinal tract may be withdrawn by Miller-Abbott tubes. The fluid formed within the intestine contains an average of 0.5 to 0.6 per cent sodium chloride. When water is given orally, it is quickly converted to a saline solution in the intestinal tract. It has been pointed out that the loss of electrolytes can be reduced by administration of sodium chloride solution orally instead of water when intestinal juice is being aspirated by a Miller-Abbott tube.

Because of the fluid loss in diarrhea, additional fluids must be given orally or parenterally; otherwise the patient will become dehydrated. Administration of 5 per cent dextrose solution given orally in diarrhea would not be wise, as the dextrose is readily fermentable and in diarrheal states there is already an increased fermentation. Rice water is a starch, probably not as fermentative as dextrose, and in all probability the starch passes quickly

along in the gastrointestinal tract so that fermentation is not increased. Apple is recommended for its pectin content, and small amounts of scraped raw apple should be offered frequently. Pectin is often combined with kaolin (as in kaopectate®), and the combination is said to absorb toxic intestinal materials and consolidate the stool. Identification of the cause of the diarrhea, whether enteral or parenteral, and treatment with appropriate chemotherapeutic or antibiotic agents are essential considerations in the treatment of infantile diarrheas.

SPONTANEOUS ABORTION

To the Editor:—*A 35 year old white woman with four previous term pregnancies, the youngest child being about 2 years of age, was desirous of an additional pregnancy. All physical findings were normal. Two weeks after the first missed menstrual period, speculum examination showed decided cyanosis of the cervix. In the eighth week the patient began a slight flow of blood and a slight endometrial hyperplasia at the mouth of the cervix. A moderate flow continued until the fourth day, when six hours of severe cramping yielded pieces of placenta. Bleeding gradually decreased. On the tenth day the os was closed and the uterus, in its accustomed anterior position, was felt to be involuting. Are there any indications for curettage? Are there any measures to be taken to insure future conception and maintenance of the pregnancy?*

M.D., Kentucky.

Answer.—When women continue to bleed as the result of retention of some products of conception, a curettage should be performed. However, there is a difference of opinion concerning the treatment when bleeding stops after a spontaneous abortion. Most obstetricians and gynecologists do not perform a curettage if bleeding ceases and the cervix closes after an abortion. There are others who perform a curettement almost routinely in such cases to make certain that all parts of the fetus, placenta and membranes are removed. Not infrequently at the time of such an operation, placental tissue is found. The patient may try to conceive after she has had two menstrual periods. At that time ovulation is restored in most cases. The methods of prevention and treatment of spontaneous abortion are unsatisfactory; hence no specific treatment can be given. Some physicians use estrogens; others employ progesterone; some use a combination of the two; still others prescribe thyroid and so on. However, the results when none of this therapy is used are about the same as when expensive treatment is used.

EYE INJURIES IN WELDERS

To the Editor:—*Please give available information concerning the incidence of blindness related to welding.*

John E. Donovan, M.D., Erie, Pa.

Answer.—Blindness among welders is probably no more frequent than among workers in kindred mechanical trades, but lesser injuries are far more prevalent. Mechanical trauma is the chief cause of total blindness. Ultraviolet radiation leads to flash injuries with painful surface damage, but less than 1 per cent of ultraviolet rays penetrate the interior of the eye. Ultraviolet rays are capable of inducing severe damage, but exposure is largely self limiting. Acute damage eliminates the prospect of sustained exposure. Superficial keratitis could lead to surface opacities to the point of impaired vision, but this severity is rare. On the other hand, infrared rays constituting some 69 per cent of the total radiation, with 31 per cent representing short infrared rays, do enter the deeper eye to the extent of about 12 per cent. The usual protection against the more active ultraviolet rays does not always exclude the infrared rays. As a result, cataracts could arise; statistically, however, such condition is infrequent. This type of a cataract is similar to that occurring among glass workers and chain makers. Retinitis is known to occur, leading on occasion to complete or partial loss of the central vision but may not be permanent. At times a "retinal hole" may be demonstrated, which may not arise for many months after exposure. In general, deep injuries to the eyes of welders from radiation are to be attributed to short infrared rays.

TRICHOTILLOMANIA

To the Editor:—*A mother complains that her child, age 3½ years, "pulls her hair out for the past year and half, mostly when she is sleeping." She had an anesthetic 18 months previously for work done on one of her eyes. She has no apparent endocrine imbalance. I am at a loss for an explanation to the mother. What factors are involved in this case? This child has one brother, four years her senior. The home situation is happy. This child's previous illnesses have been minor. Her dietary habits are normal. She eats almost everything. The mother has put gloves on the child at bedtime, so she is unable to grasp the hair with her fingers; it is beginning to grow in.*

Boyce M. Field, M.D., Pittsburgh.

Answer.—Trichotillomania is the term applied to the condition in which the patient has the habit of pulling out hair from small areas of the scalp or eyebrows; this usually results in a temporary patchy alopecia. This habit of plucking out the hair usually occurs in neuropathic children, other manifestations of which may be disturbed sleep, nightmares, night terrors, biting of finger nails, grimacing and enuresis. Occasionally the hair pulled from the patient's head is swallowed and may form a tumor in the stomach. These gastric tumors, bezoars, are found more frequently in older children than in infants, and in girls, with their long hair. If the habit of swallowing hair persists for a number of years, a hairball of considerable size may form; such a tumor is known as a trichobezoar.

Probably this 3½ year old girl pulls her hair out before she falls asleep, and, as stated, the mother has solved the problem by covering the child's fingers with gloves at bedtime. The hair pulling is probably not associated with such disorders of sleep as talking in the sleep, nightmares, night terrors and sleep walking, nor is it related to rhythmic rolling of the head just before the child falls asleep, known as jactatio capitis nocturna. In all probability the hair pulling in this child is a mannerism that is a manifestation of a neuropathic tendency in her personality.

POSITIVE BLOOD REACTIONS IN A PROSPECTIVE BRIDEGROOM

To the Editor:—*A 30 year old, single, white man, who has never had venereal disease of any kind, recently had a premarital blood test. The Kolmer reaction was positive in a dilution of 1:1 (Venereal Disease Research Laboratory antigen), and the Kline reaction was positive in a dilution of 1:2. Should this man be treated for syphilis?*

Robert E. Jameson, M.D., Davenport, Ia.

Answer.—The above serologic pattern is similar to those usually observed in patients with syphilis. In the absence of any clinical or anamnestic evidence of a syphilitic infection, specific antisyphilitic therapy should be withheld for at least three months. During that period the patient should be subjected to serologic examination with quantitative procedures at monthly intervals in order that any change in the serologic titer may be noted. If, at the end of this time, there has been no appreciable reduction in serologic titer, the patient should be afforded the protection of a course of penicillin therapy. The cardiovascular and central nervous systems, and the spinal fluid should be examined prior to the administration of the penicillin therapy.

NAUSEA AND VOMITING OF PREGNANCY

To the Editor:—*What is your opinion on the use of testosterone for mild symptoms of toxemia of pregnancy, such as nausea, vomiting, concomitant weakness and anemia, of the first trimester. Estrogens were not tolerated at all in this case, and diethylstilbestrol caused marked aggravation. Progesterone was of definite help for eight to 12 hours. Is continuation of androgen therapy permissible, and, if so, how long?*

R. J. Kent, M.D., Savannah, N. Y.

Answer.—In the light of present knowledge the use of testosterone as indicated does not seem necessary. If given before sex determination, it can be dangerous from the point of view of causing hermaphroditism. Estrogens are thought to produce

the symptoms mentioned (nausea and vomiting). These symptoms can be reproduced in the menopausal patient by administration of large doses, so their use would be of no value. Anemia normally accompanies pregnancy; it is brought about by dilution of the blood (hydremia) but is usually not manifested early. When anemia is present in very early pregnancy, it is usually a secondary anemia which was present before the woman became pregnant.

Most of the symptoms of early pregnancy can be relieved by the following measures: 1. Some time should be spent by the physician at the first visit to explain the process, relieve the fear and tension developed in many young women by their elders concerning pregnancy and by making the patient understand by sympathetic but understanding firmness that she must follow directions to the letter and not listen to outside (old wives') tales. This is of utmost importance. 2. The patient should have a very high protein, almost fat-free diet with three meals a day, including a good breakfast and a well balanced routine of work, exercise and rest. 3. The addition of ferrous sulfate, calcium and vitamins usually makes the patient feel better. 4. The addition of a small dose of thyroid (30 mg.) if the patient shows no increase in pulse rate. 5. In the areas where the iodine content is low in food and water small doses of strong iodine (Lugol's) solution may be given to enhance thyroid function.

The relief of nausea and vomiting of pregnancy is extremely difficult to evaluate, because many times the patient consults the physician about the time it would normally stop, so anything he gives the patient apparently relieves it.

The above routine accompanied by frequent examination to observe the patient and to relieve her anxiety, makes nausea and vomiting a very minor problem.

FOWLER'S SOLUTION

To the Editor:—*What is the total amount of arsenic in the form of Fowler's solution (potassium arsenite) that may be considered within safe limits for an adult over a period of years. Might the drug produce cancer without producing keratotic changes in the skin?*

H. C. Goldberg, M.D., Plainfield, N. J.

Answer.—The development of keratoses from potassium arsenite is in many instances determined by the factor of individual sensitivity. Keratoses may develop after the ingestion of relatively small amounts of potassium arsenite in some persons and only after prolonged usage in others. It is, therefore, impossible to determine a safe dosage in terms of total amount that may be administered safely. Arsenical keratoses frequently develop into squamous cell carcinoma, and some physicians believe that such carcinomas may develop even without the development of keratoses. For that reason potassium arsenite is used much less than in former days and, when used, is prescribed with a nonrefillable prescription. Many physicians prescribe not more than 30 cc. or 60 cc. in total amount, and many others discontinued its use long ago.

RECURRING KIDNEY STONES

To the Editor:—*What is the latest recommendation for prevention of recurring kidney stones?*

P. T. Kilman, M.D., Malakoff, Texas.

Answer.—In general there is no specific method applicable to all cases to prevent the recurrence of stones. All foci of infection should be eradicated, such as infection of teeth, tonsils and sinuses. Urinary stasis predisposes to the formation of stones. Therefore, all lesions in the urinary tract associated with stasis due to obstruction call for removal of the obstruction, such as strictures at the ureteropelvic junction, strictures at the ureterovesical junction and obstruction at the neck of the bladder. After operation for stone in the kidney or ureter, the patient should be encouraged to drink a great deal of water. If on chemical examination the stone shows the presence of calcium oxalate, the ingestion of foods rich in oxalates should be avoided (e. g., spinach, asparagus, tomatoes, rhubarb, strawberries, chocolate and cocoa). In the case of pure uric acid stones one might avoid the excessive use of foods rich in protein.

UNABSORBED BEESWAX

To the Editor:—*A 28 year old woman received an intramuscular injection of penicillin in beeswax about two years ago, and she has complained of pain in the gluteal area since that time. A recent x-ray revealed an unabsorbed mass of beeswax lodged deeply within the muscle tissue. Would you consider the substance carcinogenic, and would you also consider surgical removal of the mass described?* *M.D., New Jersey.*

Answer.—Beeswax was used in the suspension of penicillin in oil and beeswax because there was no evidence of its becoming carcinogenic. Paraffin, on the other hand, is known to produce paraffinomas. To date there have been no reported instances of tumor formation following the injection of beeswax. The mass should be removed if the symptoms warrant it. Applications of heat for a period of time might relieve the symptoms and make surgical removal unnecessary.

ASYMMETRIC INFRAGLUTEAL CREASES

To the Editor:—*In Queries and Minor Notes in* The Journal *of March 10, 1951 (page 773) the statement is made that asymmetry of the gluteal folds is "so common that it should not be listed as a sign of congenital dislocation of the hip." Infragluteal folds are known to be asymmetrical in about 30 per cent of normal, fat infants, while asymmetry of the gluteal folds is rare except in the shortening induced by ascent of the femoral head up the ileum. It is a difficult sign to assess, however, because it is of value only in early infancy when any deviation from a straight line extension makes one or the other gluteal fold appear to be higher than its mate.*

Although the question is concerned with the diagnosis of congenital dislocation of the hip in infancy, during which time the hip is only rarely dislocated, the editorial reply listed included those signs which appear only after dislocation has occurred. In early infancy the condition present, with the rare exceptions recognizable by the signs of dislocation at any age, is a soft, cartilaginous, persistent fetal hip which is splinted by the surrounding muscles. The strong unopposed abductors limit the abduction to 45 degrees or less in the affected leg, from the normal of 60 degrees plus. As dislocation begins, usually at about 6 weeks of age, gluteal asymmetry accompanies the subsequent shortening.

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VOCAL TRAINING

To the Editor:—*In reference to the query on "Vocal Training" in* The Journal *of Dec. 2, 1950 (page 1223), I should like to call attention to the fact that much work concerning this question has been done within the medical profession. The editorial in the Dec. 27, 1947 issue of* The Journal *deals with "Hygiene of the Voice," with mention of the most important American contributions to vocal training. It is true that most of the scientists actively interested in voice problems do not belong to the medical profession; but by no means is this true of all of them. Because there are many possible reasons why a voice remains underdeveloped, an exact diagnosis is necessary. This is one of the reasons that persons making the diagnosis as well as those offering treatment should have a medical background.* *Emil Froeschels, M.D.,*
133 East 58th Street, New York 22.

To the Editor:—*I was surprised that no mention of the National Hospital for Speech Disorders was made in* The Journal *(Dec. 2, 1950) in reply to an inquiry regarding facilities for helping persons with voice problems. This is the only medical-educational institution in the world devoted exclusively to the treatment of speech and voice disorders. The hospital includes a special voice department, in which the services of physicians, psychiatrists, psychologists and voice clinicians are available.* *Ruth M. Clark,*
Assistant Administrator,
National Hospital for Speech Disorders,
61 Irving Place, New York 3.